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PROCEEDINGS OF
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Session 1958–59

Vol. 171 Part 2

ALFRED RUSSEL WALLACE: HIS PRE-DARWINIAN ESSAY OF 1855

By Professor C. F. A. Pantin, Pres. L.S.

All know that Alfred Russel Wallace's essay from Ternate on Evolution by Natural Selection was the immediate stimulus which caused Charles Darwin not merely to publish their famous joint paper of 1858 but also to produce the *Origin of Species* in 1859. It is perhaps less generally realised how Wallace came to send that essay to Darwin and how great his contribution to the whole question of evolution was.*

Wallace had become a correspondent of Darwin's whilst he was in Sarawak. He wrote an essay which is here reprinted, and published it in the *Annals and Magazine of Natural History* for 1855.** Sir Charles Lyell was much struck by this essay—as was Thomas Henry Huxley later. Lyell brought it to the notice of Charles Darwin, who characteristically then wrote to Wallace telling him how well he thought of it.

The importance of this essay is twofold. It is perhaps the most important 'Pre-Darwinian' essay on the Origin of Species apart from the works of Lamarck. Further, taken together with his 1858 essay it shows that Wallace did not merely contribute the notion of natural selection but had in effect a complete skeleton for a work on the Origin of Species such as Darwin possessed at the time of his 1842 essay.

In this 'Sarawak' essay, Wallace shows that biogeographical and geological evidence, and that of the natural classification, is consistent with his law 'Every species has come into existence coincident in time and space with a pre-existing closely allied species'. Special creation would thus only be true under conditions in which by small local steps it became convergent with evolution.

The cause of Wallace's writing this essay was that the extraordinarily versatile naturalist Edward Forbes had published in his Presidential Address to the Geological Society for 1854 his theory of 'polarity' in the creation of living things. Forbes saw that the simpler organisms—algae and protozoa—seem closely related, while higher organisms seem to diverge in two opposite ways from these, as plants and as animals. Again, he thought that individual groups showed divergent maxima of development separated geographically by regions of minimal development. Further, he was struck by the great variety of organisms known in the early Palaeozoic and at the present day as compared with the apparent minimum in the Trias. He concluded that both in time and space creation showed passage from a maximum through a minimum to a fresh maximum of different forms.

Wallace would have none of this 'ideal absurdity' and his admirably logical Sarawak essay shows how much better his simple law conformed with the facts. Tragically Forbes, the greatest naturalist of his time, died nine

* See Pantin, C. F. A. (June 1959), Alfred Russel Wallace, F.R.S., and his Essays of 1858 and 1855. *Notes roy. Soc., Lond.*, **14**: 67–84.

***Ann. Mag. nat. Hist.*, Ser. 2, **16**: 184–196 (Sept. 1855).

months after he delivered his address ; so the issue between him and Wallace was never joined. But the logical precision of Wallace's argument, compared with the extravagant hypotheses of all previous evolutionists, would seem to leave no doubt as to what would have been the upshot of an argument with so wise and fair a man as Forbes. In 1855 all that Wallace needed to complete his theory was natural selection. In his own words :

> '. . . I had not the least idea of the nature of Darwin's proposed work, nor of the definite conclusions he had arrived at, nor had I myself any expectation of a complete solution of the great problem to which my paper was merely the prelude. Yet less than two months later that solution flashed upon me, and to a large extent marked out a different line of work from that which I had up to this time anticipated. '

(The essay has been reproduced in facsimile by photographic methods. In the original, pages 184, 186, 188, 190, 192, 194, and 196 are left-hand pages while 185, 187, 189, 191, 193 and 195 are right-hand ; this explains how, as now printed, the original page numbers are towards the inner margins and the two parts of the running page-titles are reversed.

The Council of the Society are much endebted to the publishers of the Annals and Magazine of Natural History for permission to reproduce the essay.

Editorial Secretary)

184 Mr. A. R. Wallace *on the Law which has regulated*

XVIII.—*On the Law which has regulated the Introduction of New Species.* By Alfred R. Wallace, F.R.G.S.

Every naturalist who has directed his attention to the subject of the geographical distribution of animals and plants, must have been interested in the singular facts which it presents. Many of these facts are quite different from what would have been anticipated, and have hitherto been considered as highly curious, but quite inexplicable. None of the explanations attempted from the time of Linnæus are now considered at all satisfactory; none of them have given a cause sufficient to account for the facts known at the time, or comprehensive enough to include all the new facts which have since been, and are daily being added. Of late years, however, a great light has been thrown upon the subject by geological investigations, which have shown that the present state of the earth, and the organisms now inhabiting it, are but the last stage of a long and uninterrupted series of changes which it has undergone, and consequently, that to endeavour to explain and account for its present condition without any reference to those changes (as has frequently been done) must lead to very imperfect and erroneous conclusions.

The facts proved by geology are briefly these:—That during an immense, but unknown period, the surface of the earth has undergone successive changes; land has sunk beneath the ocean, while fresh land has risen up from it; mountain chains have been elevated; islands have been formed into continents, and continents submerged till they have become islands; and these changes have taken place, not once merely, but perhaps hundreds, perhaps thousands of times:—That all these operations have been more or less continuous, but unequal in their progress, and during the whole series the organic life of the earth has undergone a corresponding alteration. This alteration also has been gradual, but complete; after a certain interval not a single species existing which had lived at the commencement of the period. This complete renewal of the forms of life also appears to have occurred several times:—That from the last of the Geological epochs to the present or Historical epoch, the change of organic life has been gradual: the first appearance of animals now existing can in many cases be traced, their numbers gradually increasing in the more recent formations, while other species continually die out and disappear, so that the present condition of the organic world is clearly derived by a natural process of gradual extinction and creation of species from that of the latest geological periods. We may therefore safely infer a like gradation and natural sequence from one geological epoch to another.

Now, taking this as a fair statement of the results of geological inquiry, we see that the present geographical distribution of life upon the earth must be the result of all the previous changes, both of the surface of the earth itself and of its inhabitants. Many causes no doubt have operated of which we must ever remain in ignorance, and we may therefore expect to find many details very difficult of explanation, and in attempting to give one, must allow ourselves to call into our service geological changes which it is highly probable may have occurred, though we have no direct evidence of their individual operation.

The great increase of our knowledge within the last twenty years, both of the present and past history of the organic world, has accumulated a body of facts which should afford a sufficient foundation for a comprehensive law embracing and explaining them all, and giving a direction to new researches. It is about ten years since the idea of such a law suggested itself to the writer of this paper, and he has since taken every opportunity of testing it by all the newly ascertained facts with which he has become acquainted, or has been able to observe himself. These have all served to convince him of the correctness of his hypothesis. Fully to enter into such a subject would occupy much space, and it is only in consequence of some views having been lately promulgated, he believes in a wrong direction, that he now ventures to present his ideas to the public, with only such obvious illustrations of the arguments and results as occur to him in a place far removed from all means of reference and exact information.

The following propositions in Organic Geography and Geology give the main facts on which the hypothesis is founded.

Geography.

1. Large groups, such as classes and orders, are generally spread over the whole earth, while smaller ones, such as families and genera, are frequently confined to one portion, often to a very limited district.
2. In widely distributed families the genera are often limited in range; in widely distributed genera, well-marked groups of species are peculiar to each geographical district.
3. When a group is confined to one district, and is rich in species, it is almost invariably the case that the most closely allied species are found in the same locality or in closely adjoining localities, and that therefore the natural sequence of the species by affinity is also geographical.
4. In countries of a similar climate, but separated by a wide sea or lofty mountains, the families, genera and species of the

one are often represented by closely allied families, genera and species peculiar to the other.

Geology.

5. The distribution of the organic world in time is very similar to its present distribution in space.
6. Most of the larger and some small groups extend through several geological periods.
7. In each period, however, there are peculiar groups, found nowhere else, and extending through one or several formations.
8. Species of one genus, or genera of one family occurring in the same geological time are more closely allied than those separated in time.
9. As generally in geography no species or genus occurs in two very distant localities without being also found in intermediate places, so in geology the life of a species or genus has not been interrupted. In other words, no group or species has come into existence twice.
10. The following law may be deduced from these facts:—*Every species has come into existence coincident both in space and time with a pre-existing closely allied species.*

This law agrees with, explains and illustrates all the facts connected with the following branches of the subject:—1st. The system of natural affinities. 2nd. The distribution of animals and plants in space. 3rd. The same in time, including all the phænomena of representative groups, and those which Professor Forbes supposed to manifest polarity. 4th. The phænomena of rudimentary organs. We will briefly endeavour to show its bearing upon each of these.

If the law above enunciated be true, it follows that the natural series of affinities will also represent the order in which the several species came into existence, each one having had for its immediate antitype a closely allied species existing at the time of its origin. It is evidently possible that two or three distinct species may have had a common antitype, and that each of these may again have become the antitypes from which other closely allied species were created. The effect of this would be, that so long as each species has had but one new species formed on its model, the line of affinities will be simple, and may be represented by placing the several species in direct succession in a straight line. But if two or more species have been independently formed on the plan of a common antitype, then the series of affinities will be compound, and can only be represented by a forked or many-branched line. Now, all attempts at a Natural classification and arrangement of organic beings show, that both

these plans have obtained in creation. Sometimes the series of affinities can be well represented for a space by a direct progression from species to species or from group to group, but it is generally found impossible so to continue. There constantly occur two or more modifications of an organ or modifications of two distinct organs, leading us on to two distinct series of species, which at length differ so much from each other as to form distinct genera or families. These are the parallel series or representative groups of naturalists, and they often occur in different countries, or are found fossil in different formations. They are said to have an analogy to each other when they are so far removed from their common antitype as to differ in many important points of structure, while they still preserve a family resemblance. We thus see how difficult it is to determine in every case whether a given relation is an analogy or an affinity, for it is evident that as we go back along the parallel or divergent series, towards the common antitype, the analogy which existed between the two groups becomes an affinity. We are also made aware of the difficulty of arriving at a true classification, even in a small and perfect group;—in the actual state of nature it is almost impossible, the species being so numerous and the modifications of form and structure so varied, arising probably from the immense number of species which have served as antitypes for the existing species, and thus produced a complicated branching of the lines of affinity, as intricate as the twigs of a gnarled oak or the vascular system of the human body. Again, if we consider that we have only fragments of this vast system, the stem and main branches being represented by extinct species of which we have no knowledge, while a vast mass of limbs and boughs and minute twigs and scattered leaves is what we have to place in order, and determine the true position each originally occupied with regard to the others, the whole difficulty of the true Natural System of classification becomes apparent to us.

We shall thus find ourselves obliged to reject all those systems of classification which arrange species or groups in circles, as well as those which fix a definite number for the divisions of each group. The latter class have been very generally rejected by naturalists, as contrary to nature, notwithstanding the ability with which they have been advocated; but the circular system of affinities seems to have obtained a deeper hold, many eminent naturalists having to some extent adopted it. We have, however, never been able to find a case in which the circle has been closed by a direct and close affinity. In most cases a palpable analogy has been substituted, in others the affinity is very obscure or altogether doubtful. The complicated branching of the lines of affinities in extensive groups must also afford great

facilities for giving a show of probability to any such purely artificial arrangements. Their death-blow was given by the admirable paper of the lamented Mr. Strickland, published in the 'Annals of Natural History,' in which he so clearly showed the true synthetical method of discovering the Natural System.

If we now consider the geographical distribution of animals and plants upon the earth, we shall find all the facts beautifully in accordance with, and readily explained by, the present hypothesis. A country having species, genera, and whole families peculiar to it, will be the necessary result of its having been isolated for a long period, sufficient for many series of species to have been created on the type of pre-existing ones, which, as well as many of the earlier-formed species, have become extinct, and thus made the groups appear isolated. If in any case the antitype had an extensive range, two or more groups of species might have been formed, each varying from it in a different manner, and thus producing several representative or analogous groups. The *Sylviadæ* of Europe and the *Sylvicolidæ* of North America, the *Heliconidæ* of South America and the *Euplœas* of the East, the group of *Trogons* inhabiting Asia, and that peculiar to South America, are examples that may be accounted for in this manner.

Such phænomena as are exhibited by the Galapagos Islands, which contain little groups of plants and animals peculiar to themselves, but most nearly allied to those of South America, have not hitherto received any, even a conjectural explanation. The Galapagos are a volcanic group of high antiquity, and have probably never been more closely connected with the continent than they are at present. They must have been first peopled, like other newly-formed islands, by the action of winds and currents, and at a period sufficiently remote to have had the original species die out, and the modified prototypes only remain. In the same way we can account for the separate islands having each their peculiar species, either on the supposition that the same original emigration peopled the whole of the islands with the same species from which differently modified prototypes were created, or that the islands were successively peopled from each other, but that new species have been created in each on the plan of the pre-existing ones. St. Helena is a similar case of a very ancient island having obtained an entirely peculiar, though limited, flora. On the other hand, no example is known of an island which can be proved geologically to be of very recent origin (late in the Tertiary, for instance), and yet possesses generic or family groups, or even many species peculiar to itself.

When a range of mountains has attained a great elevation, and has so remained during a long geological period, the species

of the two sides at and near their bases will be often very different, representative species of some genera occurring, and even whole genera being peculiar to one side only, as is remarkably seen in the case of the Andes and Rocky Mountains. A similar phænomenon occurs when an island has been separated from a continent at a very early period. The shallow sea between the Peninsula of Malacca, Java, Sumatra and Borneo was probably a continent or large island at an early epoch, and may have become submerged as the volcanic ranges of Java and Sumatra were elevated. The organic results we see in the very considerable number of species of animals common to some or all of these countries, while at the same time a number of closely allied representative species exist peculiar to each, showing that a considerable period has elapsed since their separation. The facts of geographical distribution and of geology may thus mutually explain each other in doubtful cases, should the principles here advocated be clearly established.

In all those cases in which an island has been separated from a continent, or raised by volcanic or coralline action from the sea, or in which a mountain-chain has been elevated, in a recent geological epoch, the phænomena of peculiar groups or even of single representative species will not exist. Our own island is an example of this, its separation from the continent being geologically very recent, and we have consequently scarcely a species which is peculiar to it; while the Alpine range, one of the most recent mountain elevations, separates faunas and floras which scarcely differ more than may be due to climate and latitude alone.

The series of facts alluded to in Proposition 3, of closely allied species in rich groups being found geographically near each other, is most striking and important. Mr. Lovell Reeve has well exemplified it in his able and interesting paper on the Distribution of the *Bulimi*. It is also seen in the Humming-birds and Toucans, little groups of two or three closely allied species being often found in the same or closely adjoining districts, as we have had the good fortune of personally verifying. Fishes give evidence of a similar kind: each great river has its peculiar genera, and in more extensive genera its groups of closely allied species. But it is the same throughout Nature; every class and order of animals will contribute similar facts. Hitherto no attempt has been made to explain these singular phænomena, or to show how they have arisen. Why are the genera of Palms and of Orchids in almost every case confined to one hemisphere? Why are the closely allied species of brown-backed Trogons all found in the East, and the green-backed in the West? Why are the Macaws and the Cockatoos similarly restricted? Insects

furnish a countless number of analogous examples;—the *Goliathi* of Africa, the *Ornithopteræ* of the Indian islands, the *Heliconidæ* of South America, the *Danaidæ* of the East, and in all, the most closely allied species found in geographical proximity. The question forces itself upon every thinking mind,—why are these things so? They could not be as they are, had no law regulated their creation and dispersion. The law here enunciated not merely explains, but necessitates the facts we see to exist, while the vast and long-continued geological changes of the earth readily account for the exceptions and apparent discrepancies that here and there occur. The writer's object in putting forward his views in the present imperfect manner is to submit them to the test of other minds, and to be made aware of all the facts supposed to be inconsistent with them. As his hypothesis is one which claims acceptance solely as explaining and connecting facts which exist in nature, he expects facts alone to be brought to disprove it; not *à-priori* arguments against its probability.

The phænomena of geological distribution are exactly analogous to those of geography. Closely allied species are found associated in the same beds, and the change from species to species appears to have been as gradual in time as in space. Geology, however, furnishes us with positive proof of the extinction and production of species, though it does not inform us how either has taken place. The extinction of species, however, offers but little difficulty, and the *modus operandi* has been well illustrated by Sir C. Lyell in his admirable 'Principles.' Geological changes, however gradual, must occasionally have modified external conditions to such an extent as to have rendered the existence of certain species impossible. The extinction would in most cases be effected by a gradual dying-out, but in some instances there might have been a sudden destruction of a species of limited range. To discover how the extinct species have from time to time been replaced by new ones down to the very latest geological period, is the most difficult, and at the same time the most interesting problem in the natural history of the earth. The present inquiry, which seeks to eliminate from known facts a law which has determined, to a certain degree, what species could and did appear at a given epoch, may, it is hoped, be considered as one step in the right direction towards a complete solution of it.

Much discussion has of late years taken place on the question, whether the succession of life upon the globe has been from a lower to a higher degree of organization? The admitted facts seem to show that there has been a general, but not a detailed progression. Mollusca and Radiata existed before Vertebrata,

and the progression from Fishes to Reptiles and Mammalia, and also from the lower mammals to the higher, is indisputable. On the other hand, it is said that the Mollusca and Radiata of the very earliest periods were more highly organized than the great mass of those now existing, and that the very first fishes that have been discovered are by no means the lowest organized of the class. Now it is believed the present hypothesis will harmonize with all these facts, and in a great measure serve to explain them; for though it may appear to some readers essentially a theory of progression, it is in reality only one of gradual change. It is, however, by no means difficult to show that a real progression in the scale of organization is perfectly consistent with all the appearances, and even with apparent retrogression, should such occur.

Returning to the analogy of a branching tree, as the best mode of representing the natural arrangement of species and their successive creation, let us suppose that at an early geological epoch any group (say a class of the Mollusca) has attained to a great richness of species and a high organization. Now let this great branch of allied species, by geological mutations, be completely or partially destroyed. Subsequently a new branch springs from the same trunk, that is to say, new species are successively created, having for their antitypes the same lower organized species which had served as the antitypes for the former group, but which have survived the modified conditions which destroyed it. This new group being subject to these altered conditions, has modifications of structure and organization given to it, and becomes the representative group of the former one in another geological formation. It may, however, happen, that though later in time, the new series of species may never attain to so high a degree of organization as those preceding it, but in its turn become extinct, and give place to yet another modification from the same root, which may be of higher or lower organization, more or less numerous in species, and more or less varied in form and structure than either of those which preceded it. Again, each of these groups may not have become totally extinct, but may have left a few species, the modified prototypes of which have existed in each succeeding period, a faint memorial of their former grandeur and luxuriance. Thus every case of apparent retrogression may be in reality a progress, though an interrupted one: when some monarch of the forest loses a limb, it may be replaced by a feeble and sickly substitute. The foregoing remarks appear to apply to the case of the Mollusca, which, at a very early period, had reached a high organization and agreat development of forms and species in the Testaceous Cephalopoda. In each succeeding age

modified species and genera replaced the former ones which had become extinct, and as we approach the present æra but few and small representatives of the group remain, while the Gasteropods and Bivalves have acquired an immense preponderance. In the long series of changes the earth has undergone, the process of peopling it with organic beings has been continually going on, and whenever any of the higher groups have become nearly or quite extinct, the lower forms which have better resisted the modified physical conditions have served as the antitypes on which to found the new races. In this manner alone, it is believed, can the representative groups at successive periods, and the risings and fallings in the scale of organization, be in every case explained.

The hypothesis of polarity, recently put forward by Professor Edward Forbes* to account for the abundance of generic forms at a very early period and at present, while in the intermediate epochs there is a gradual diminution and impoverishment, till the minimum occurred at the confines of the Palæozoic and Secondary epochs, appears to us quite unnecessary, as the facts may be readily accounted for on the principles already laid down. Between the Palæozoic and Neozoic periods of Professor Forbes, there is scarcely a species in common, and the greater part of the genera and families also disappear to be replaced by new ones. It is almost universally admitted that such a change in the organic world must have occupied a vast period of time. Of this interval we have no record; probably because the whole area of the early formations now exposed to our researches was elevated at the end of the Palæozoic period, and remained so through the interval required for the organic changes which resulted in the fauna and flora of the Secondary period. The records of this interval are buried beneath ocean which covers three-fourths of the globe. Now it appears highly probable that a long period of quiescence or stability in the physical conditions of a district would be most favourable to the existence of organic life in the greatest abundance, both as regards individuals and also as to variety of species and generic groups, just as we now find that the places best adapted to the rapid growth and increase of individuals also contain the greatest profusion of species and the greatest variety of forms,—the tropics in comparison with the temperate and arctic regions. On the other hand, it seems no less probable that a change in the

* Since the above was written, the author has heard with sincere regret of the death of this eminent naturalist, from whom so much important work was expected. His remarks on the present paper,—a subject on which no man was more competent to decide,—were looked for with the greatest interest. Who shall supply his place?

physical conditions of a district, even small in amount if rapid, or even gradual if to a great amount, would be highly unfavourable to the existence of individuals, might cause the extinction of many species, and would probably be equally unfavourable to the creation of new ones. In this too we may find an analogy with the present state of our earth, for it has been shown to be the violent extremes and rapid changes of physical conditions, rather than the actual mean state in the temperate and frigid zones, which renders them less prolific than the tropical regions, as exemplified by the great distance beyond the tropics to which tropical forms penetrate when the climate is equable, and also by the richness in species and forms of tropical mountain regions which principally differ from the temperate zone in the uniformity of their climate. However this may be, it seems a fair assumption that during a period of geological repose the new species which we know to have been created would have appeared, that the creations would then exceed in number the extinctions, and therefore the number of species would increase. In a period of geological activity, on the other hand, it seems probable that the extinctions might exceed the creations, and the number of species consequently diminish. That such effects did take place in connexion with the causes to which we have imputed them, is shown in the case of the Coal formation, the faults and contortions of which show a period of great activity and violent convulsions, and it is in the formation immediately succeeding this that the poverty of forms of life is most apparent. We have then only to suppose a long period of somewhat similar action during the vast unknown interval at the termination of the Palæozoic period, and then a decreasing violence or rapidity through the Secondary period, to allow for the gradual repopulation of the earth with varied forms, and the whole of the facts are explained. We thus have a clue to the increase of the forms of life during certain periods, and their decrease during others, without recourse to any causes but those we know to have existed, and to effects fairly deducible from them. The precise manner in which the geological changes of the early formations were effected is so extremely obscure, that when we can explain important facts by a retardation at one time and an acceleration at another of a process which we know from its nature and from observation to have been unequal,—a cause so simple may surely be preferred to one so obscure and hypothetical as polarity.

I would also venture to suggest some reasons against the very nature of the theory of Professor Forbes. Our knowledge of the organic world during any geological epoch is necessarily very imperfect. Looking at the vast numbers of species and groups that have been discovered by geologists, this may be

doubted; but we should compare their numbers not merely with those that now exist upon the earth, but with a far larger amount*. We have no reason for believing that the number of species on the earth at any former period was much less than at present; at all events the aquatic portion, with which geologists have most acquaintance, was probably often as great or greater. Now we know that there have been many complete changes of species; new sets of organisms have many times been introduced in place of old ones which have become extinct, so that the total amount which have existed on the earth from the earliest geological period must have borne about the same proportion to those now living, as the whole human race who have lived and died upon the earth, to the population at the present time. Again, at each epoch, the whole earth was no doubt, as now, more or less the theatre of life, and as the successive generations of each species died, their exuviæ and preservable parts would be deposited over every portion of the then existing seas and oceans, which we have reason for supposing to have been more, rather than less, extensive than at present. In order then to understand our possible knowledge of the early world and its inhabitants, we must compare, not the area of the whole field of our geological researches with the earth's surface, but the area of the examined portion of each formation separately with the whole earth. For example, during the Silurian period all the earth was Silurian, and animals were living and dying, and depositing their remains more or less over the whole area of the globe, and they were probably (the species at least) nearly as varied in different latitudes and longitudes as at present. What proportion do the Silurian districts bear to the whole surface of the globe, land and sea (for far more extensive Silurian districts probably exist beneath the ocean than above it), and what portion of the known Silurian districts has been actually examined for fossils? Would the area of rock actually laid open to the eye be the thousandth or the ten-thousandth part of the earth's surface? Ask the same question with regard to the Oolite or the Chalk, or even to particular beds of these when they differ considerably in their fossils, and you may then get some notion of how small a portion of the whole we know.

But yet more important is the probability, nay, almost the certainty, that whole formations containing the records of vast geological periods are entirely buried beneath the ocean, and for ever beyond our reach. Most of the gaps in the geological series may thus be filled up, and vast numbers of unknown and unimaginable animals, which might help to elucidate the affinities of the numerous isolated groups which are a perpetual puzzle to

[* See on this subject a paper by Professor Agassiz in the 'Annals' for November 1854.—Ed.]

the zoologist, may there be buried, till future revolutions may raise them in their turn above the waters, to afford materials for the study of whatever race of intelligent beings may then have succeeded us. These considerations must lead us to the conclusion, that our knowledge of the whole series of the former inhabitants of the earth is necessarily most imperfect and fragmentary,—as much so as our knowledge of the present organic world would be, were we forced to make our collections and observations only in spots equally limited in area and in number with those actually laid open for the collection of fossils. Now, the hypothesis of Professor Forbes is essentially one that assumes to a great extent the *completeness* of our knowledge of the *whole series* of organic beings which have existed on the earth. This appears to be a fatal objection to it, independently of all other considerations. It may be said that the same objections exist against every theory on such a subject, but this is not necessarily the case. The hypothesis put forward in this paper depends in no degree upon the completeness of our knowledge of the former condition of the organic world, but takes what facts we have as fragments of a vast whole, and deduces from them something of the nature and proportions of that whole which we can never know in detail. It is founded upon isolated groups of facts, recognizes their isolation, and endeavours to deduce from them the nature of the intervening portions.

Another important series of facts, quite in accordance with, and even necessary deductions from, the law now developed, are those of *rudimentary organs*. That these really do exist, and in most cases have no special function in the animal œconomy, is admitted by the first authorities in comparative anatomy. The minute limbs hidden beneath the skin in many of the snake-like lizards, the anal hooks of the boa constrictor, the complete series of jointed finger-bones in the paddle of the Manatus and whale, are a few of the most familiar instances. In botany a similar class of facts has been long recognized. Abortive stamens, rudimentary floral envelopes and undeveloped carpels, are of the most frequent occurrence. To every thoughtful naturalist the question must arise, What are these for? What have they to do with the great laws of creation? Do they not teach us something of the system of Nature? If each species has been created independently, and without any necessary relations with pre-existing species, what do these rudiments, these apparent imperfections mean? There must be a cause for them; they must be the necessary results of some great natural law. Now, if, as it has been endeavoured to be shown, the great law which has regulated the peopling of the earth with animal and vegetable life is, that every change shall be gradual; that no new

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creature shall be formed widely differing from anything before existing; that in this, as in everything else in Nature, there shall be gradation and harmony,—then these rudimentary organs are necessary, and are an essential part of the system of Nature. Ere the higher Vertebrata were formed, for instance, many steps were required, and many organs had to undergo modifications from the rudimental condition in which only they had as yet existed. We still see remaining an antitypal sketch of a wing adapted for flight in the scaly flapper of the penguin, and limbs first concealed beneath the skin, and then weakly protruding from it, were the necessary gradations before others should be formed fully adapted for locomotion. Many more of these modifications should we behold, and more complete series of them, had we a view of all the forms which have ceased to live. The great gaps that exist between fishes, reptiles, birds and mammals would then, no doubt, be softened down by intermediate groups, and the whole organic world would be seen to be an unbroken and harmonious system.

It has now been shown, though most briefly and imperfectly, how the law that "*Every species has come into existence coincident both in time and space with a pre-existing closely allied species,*" connects together and renders intelligible a vast number of independent and hitherto unexplained facts. The natural system of arrangement of organic beings, their geographical distribution, their geological sequence, the phænomena of representative and substituted groups in all their modifications, and the most singular peculiarities of anatomical structure, are all explained and illustrated by it, in perfect accordance with the vast mass of facts which the researches of modern naturalists have brought together, and, it is believed, not materially opposed to any of them. It also claims a superiority over previous hypotheses, on the ground that it not merely explains, but necessitates what exists. Granted the law, and many of the most important facts in Nature could not have been otherwise, but are almost as necessary deductions from it, as are the elliptic orbits of the planets from the law of gravitation.

Sarawak, Borneo, Feb. 1855.

'ANTITYPE' AND 'ANTETYPE': A NOTE ON WALLACE'S 1855 ESSAY

By W. T. Stearn, F.L.S.

The word 'antitype' occurs six times in Wallace's essay and there represents a fundamental concept. It is evident, however, from the context, as when Wallace remarked that 'two or three distinct species may have had a common antitype and that each of these may again have become the antitypes from which other closely allied species were created', that Wallace did not use 'antitype' here in its proper sense but, subconsciously or maybe deliberately avoiding 'ancestor', intended 'antetype' if not 'archetype', both of which are almost the antithesis of 'antitype', since an antitype follows after and an antetype precedes something with which it is closely associated if not causally linked. The word 'antitype' (ἀντίτυπος) refers to something corresponding to something earlier (literally as a stamped impression corresponds to the die), hence following from or representative, being 'that which is shadowed forth or represented by the "type" or symbol' as exemplified in the *Oxford English Dictionary* quotation of 1841 comparing the relation of type to antitype with that of the Old Testament to the New, of porch to temple, of dawn to day. The word 'antetype' on the other hand refers to something coming before, 'a preceding type, an earlier example'. Wallace would indeed have expressed his thought better had he used 'archetype', meaning 'the original pattern from which copies are made', or 'prototype', meaning 'the first or primary type of anything'; indeed in writing of 'a few species the modified prototypes of which may have existed in each succeeding period' he evidently equated 'prototype' with his 'antitype'. Wallace's meaning is thus clear and writing in the wilds of Sarawak he can well be excused for erroneously substituting an *e* by an *i*, when putting forward views of such potential importance for biology, but it is surprising that the editor of the *Annals and Magazine of Natural History* let this pass.

RECORD OF THE PROCEEDINGS OF THE SOCIETY FOR THE SESSION 1958–1959

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Names of Donors to the Society's Library have been brought together in a consolidated list and arranged alphabetically on page 186. *A similar consolidated list on page* 168 *in the General Secretary's Report records the Deaths of Fellows Foreign Members and Associates. Elections and admissions are mentioned at the appropriate place in the record of the Meetings.*

1. The General Meetings of the Society.

2 October 1958.—The First Meeting of the Society for the session—Dr C. F. A. Pantin F.R.S., President, in the Chair.

The proceedings of the Anniversary Meeting held on 24 May 1958, having been circulated, were taken as read, and confirmed.

The following signed the Obligation in the Roll and Charter Book and were admitted Fellows:— Christopher David Parkinson; John Palmer Evenson, M.Sc.; Kenneth Leonard Alvin, B.Sc., Ph.D.

The following Resolution was read by the PRESIDENT :—

> The Fellows of The Linnean Society of London having learned with the deepest sorrow of the death of Dr Malcolm Arthur Smith, desire to place on record their high appreciation of the great services he rendered to the Society in the 30 years of his Fellowship. Elected in 1928, he served on the Council from 1939–49 and was Zoological Secretary from 1939 to 1948. During his Fellowship, Dr Malcolm Smith took the greatest interest in the work of the Society and regularly attended its Meetings. Ever mindful of the great contributions Dr Malcolm Smith made to Zoology, the Fellows desire to convey to his widow their deep sympathy on the loss of her distinguished husband.

The following communications were made :—

Mr F. N. Hepper, F.L.S.—Botanical Expedition to Adamawa, British Cameroons.

Dr H. B. D. Kettlewell (Visitor)—Darwin and the insects of Brazil. (A Sound and Colour Film.)

23 October 1958.—Dr C. F. A. Pantin, F.R.S., President, in the Chair.

The proceedings of the General Meeting held on 2 October 1958, having been circulated, were taken as read, and confirmed.

Stuart Max Walters, M.A., Ph.D., signed the Obligation in the Roll and Charter Book and was admitted a Fellow.

The following Communications were made :—

Dr Marion A. Watson (Visitor)—The Significnce of recent discoveries about aphid and hopper transmitted viruses with special reference to Wheat Striate, Mosaic Virus.

Dr A. F. Posnette (Visitor)—Leafhopper transmission of green petal and other viruses in strawberry (Discussed by Mr H. L. G. Stroyan ; Dr Posnette replied).

Professor L. J. Audus, F.L.S.—A botanist in California, illustrated with coloured slides.

6 November 1958.—Dr C. F. A. Pantin, F.R.S., President, in the Chair.

The proceedings of the General Meeting held on 23 October 1958, having been circulated, were taken as read and confirmed.

The following Communications were made :—.

Dr J. Ramsbottom, O.B.E., F.L.S.—Linnaeus, *Pan Suecica* and Nomenclature.

(Discussed by the President, Mr W. T. Stearn and Dr H. Hamshaw Thomas ; Dr Ramsbottom replied.)

Dr H. Hamshaw Thomas, M.B.E., F.R.S., V-P.L.S.—Angiosperm Evolution, historical and ecological considerations. (This paper was effectively Dr Hamshaw Thomas's Presidential Address which should have been delivered at the Anniversary Meeting on 24 May 1958. See *Proc.*, **170** : 117.)

20 November 1958.—Dr C. F. A. Pantin, F.R.S., President in the Chair.

The proceedings of the General Meeting held on 6 November 1958, having been circulated, were taken as read, and confirmed.

Prof. Sydney Cross Harland, D.Sc., F.R.S. signed the Obligation in the Roll and Charter Book, and was admitted a Fellow.

The following were balloted for and duly elected: *Fellows:* Brian James Bailey, B.Sc.; Roger Derek Beauchamp, B.Sc.; Roger Charles Carolin, B.Sc.; Prof. Sharda Ratilal Desai, M.Sc. Ph.D.; M. Durairatnam, M.Sc.; Miss Margaret Florence Mary Garat, B.Sc.; Frank James William Harding, M.A., B.Litt.; Roytan Edward Heath; Prof. Cornelius Herman Muller, M.A., Ph.D.; Prof. Herbert Hugh John Nesbitt, M.A., D.Sc., Ph.D.; Miss P. Elizabeth Perrott, M.Sc., Ph.D.; Braj Nandan Prasad, M.Sc.; Prof. Reginald Dawton Preston, D.Sc., Ph.D., F.R.S.; Richard Emery Sandell, M.A.; J. Sen, D.Phil.; Bernard C. Sharman, B.Sc., Ph.D.; Frank W. Smith; Brian T. Styles, B.A.; Harold Donovan Tindall, M.Sc. and Prof. Claude Wilson Wardlaw, D.Sc., Ph.D. *Ordinary Associates:* Peter David Weiste Barnard, B.Sc.; Emil Sigismund Sherrard, B.Sc. and Miss Suzanne Ullmann, B.Sc.

The following Communications were made:—

Lord Medway (Visitor)—Navigation on the wing in total darkness by means of echo among swiftlets of the genus *Collocalia* in Borneo, illustrated by tape recordings made in limestone caves and in the dark-room of the Sarawak Museum, Kuching.

A Symposium on Chromatography and Taxonomy

Dr E. C. Bate-Smith (Visitor)—Chromatography and Taxonomy in the Rosaceae.

Dr C. A. Wright (Visitor)—The Application of Paper Chromatography to Taxonomic Studies in the Molluscan genus *Lymnaea*. (Published in *Jl. Zool.*, **44**: 222–237).

Dr J. B. Harborne (Visitor)—The Chromatography of Flower Pigments and Plant Taxonomy, and

Dr A. T. R. Mattick and Dr N. J. Berridge (Visitors)—Paper chromatography and the differentiation of closely related types and species of bacteria.

In the general discussion the following spoke:—The President, Mr R. Ross, Dr R. Melville and Mr P. R. P. Murray.

The Meeting was then adjourned until 4 December 1958 when Exhibits were shown in the Library and Exhibitors gave a short account of their exhibits in the Meeting Room.

29 January 1959.—Dr C. F. A. Pantin F.R.S., President, in the Chair.

The proceedings of the General Meeting held on 20 November 1958, and Exhibition Meeting held on 4 December 1958, having been circulated, were taken as read and confirmed.

The following signed the Obligation in the Roll and Charter Book and were admitted Fellows: Bernard Cloat Sharman, B.Sc., Ph.D.; Richard Emery Sandell, M.A.; Frank James William Harding, M.A., B.Litt.; Royton Edward Heath; and P. Elizabeth Perrott, M.Sc., Ph.D.

The following communications were made:—

Professor C. T. Ingold, F.L.S.—Spores of Freshwater and Marine Fungi.

Mr F. C. Webber (Visitor)—*Mycosphaerella ascophylli* an Endophyte in *Ascophyllum nodosum*.

Dr Irene M. Wilson (Visitor)—Marine Fungi. (Published *Proc.*, **171** : 53–70)
(Discussed by the President, Mr J. F. Levy, Mr P. K. C. Austwick and Mr P. R. Bell ; Prof. Ingold and Dr Wilson replied.)

12 February 1959.—Dr C. F. A. Pantin, F.R.S., President, in the Chair.

The proceedings of the General Meeting held on 29 January 1959, having been circulated, were taken as read, and confirmed.

The following signed the Obligation in the Roll and Charter Book and were Admitted Fellows : Peter Adames, M.A.; Brian James Bailey, B.Sc.; Frank W. Smith.

The following communication was made :—

Dr J. L. Montieth (Visitor).—Micro-meteorology in relation to plant and animal life. (Published, *Proc.*, **171** : 71–82.)
(Discussed by the President, Mr P. R. Bell, Dr R. C. Rainey and the Zoological Secretary ; Dr Montieth replied.)

26 February 1959.—Dr C. F. A. Pantin, F.R.S., President in the Chair.

The proceedings of the General Meeting held on 12 February 1959, having been circulated, were taken as read, and confirmed.

The following signed the Obligation in the Roll and Charter Book and were admitted as Fellows : Brian William Harold Hale ; Brian T. Styles, B.A.

The President reminded Fellows that proposals for Officers and New Members of Council under Bye-Law, Chap. 8, Sec. 2, and recommendations for Foreign Members and Associates *honoris causa* should be fowarded to the General Secretary, by not later than 9 April 1959.

The President reported that Fellows were invited by the Anglo-Swedish Society to a talk and discussion followed by a Swedish Supper on the evening of 19 March.

The following communications were made :—

Mr Peter David (National Institute of Oceanography, Wormley)—Exclusive distribution of certain species of Chaetognaths.
Dr M. H. Williamson (Oceanographical Laboratory, Edinburgh)—Effects of inter-specific competition.
(Discussed by the President, Dr E. B. Worthington, Professor Varley, Dr G. S. Carter, Mr R. Ross, Dr N. A. Mackintosh and Dr D. W. Tucker ; Mr David and Dr Williamson replied.)

19 March 1959.—Dr C. F. A. Pantin, F.R.S., President in the Chair.

The proceedings of the General Meeting held on 26 February 1959, having been circulated, were taken as read, and confirmed.

William Springthorpe Lacey, B.Sc., Ph.D., signed the Obligation in the Roll and Charter Book and was admitted a Fellow.

The followed proposed alterations to the Bye-Laws were read for the first time :—

> To promote and facilitate the speedier issue of the Society's publications, the Council recommends that in addition to the Botanical and Zoological Secretaries, there should be an Editorial Secretary, and that an Editorial Committee should be appointed. The election of an Editorial

Secretary is covered by the Charters, and Bye-Law, Chapt. 11, Sec. 1. The appointment of an Editorial Committee requires an addition to the Bye-Laws, and the Council proposes the following addition :—

Chapt. 14, Sec. 1. (appointment of Committees) line 7 : after the word ' Library ' *add* " An Editorial Committee (to include the Officers)."

In view of the increased costs of printing and dispatch the Council recommended that the Annual Contribution of Ordinary Associates (who receive the Proceedings) be £2 as from 1960, and propose the following alteration to the Bye-Laws,

Chapt. 5. Sec. 9, line 4 : *delete* the words ' of one pound ' and substitute the words ' (see Appendix) '.

To avoid the possibility of having to make alterations in the Chapters of the printed Bye-Laws, the Council recommends that the Amount of the Admission Fee, and the Annual Contribution to be paid by Fellows and ordinary Associates be transferred to the Appendix to the Bye-Laws, and propose the following alterations to the Bye-Laws,

Chapt. 2, Sec. 1, line 2 : *omit* the words ' the sum of four pounds for ' and after the word ' Fee ' *add* the words ' (see Appendix) '.

Chapt. 2, Sect. 2., line 2 : *omit* the words ' of not less than five pounds ' and *replace* with the words ' (see Appendix) ', and *substitute* the words ' the like sum annually ' with the words ' his Annual Contribution '.

Appendix to the Bye-Laws : *add* the following before the Table of Composition Fees, etc.

' Admission Fee and Annual Contributions '

' The Admission Fee to be paid by Fellows (unless exempt) is four pounds.'

' The Annual Contibution to be paid by Fellows is five pounds.'

' The Annual Contribution to be paid by Ordinary Associates is two pounds.'

The following communications were made :—

Dr Kathleen I. M. Chesters A.L.S.—Ecological conditions in the Early Tertiary of Great Britain.

Professor T. M. Harris, F.R.S., F.L.S.—The possibilities of Palaeo-ecology in the Jurassic.

Dr William S. Lacey, F.L.S.—Some aspects of Palaeo-ecology in the Karroo of Rhodesia and Nyasaland.

(Discussed by the President, Dr R. E. Holttum, Mr A. W. Exell, Mr P. R. Bell, Mr J. P. M. Brenan, Dr G. S. Carter, Dr J. A. Townrow, Dr E. B. Worthington, and Dr H. Hamshaw Thomas ; Dr Chesters, Prof. Harris and Dr Lacey replied.)

2 April 1959.—Dr H. Hamshaw Thomas, M.B.E., F.R.S., Vice-President in the Chair.

The proceedings of the General Meeting held on 19 March 1959, having been circulated, were taken as read, and confirmed.

Roger Derek Beauchamp, B.Sc., signed the Obligation in the Roll and Charter Book and was admitted a Fellow.

The proposed Alterations to the Bye-Laws as detailed in the Minutes of the Meeting held on the 19 March,1959 were read for the second time.

The following Communications were made :—

Mr E. M. Marsden-Jones, F.L.S. (and the late F. E. Weiss)—Genetics and Pollination of *Anagallis arvensis* subsp. *arvensis* and *A. arvensis* subsp. *foemina*. (Published, *Proc.*, **171** : 27–29.)

(Discussed by Dr H. Hamshaw Thomas, Mr D. C. McClintock and Dr W. B. Turrill. Mr Marsden-Jones replied.)

Dr R. E. Holttum, F.L.S.—Growth-habits of Monocotyledons.

(Discussed by Dr R. Melville, Dr W. B. Turrill, Dr J. Ramsbottom and Dr H. Hamshaw Thomas. Dr Holttum replied.)

16 April 1959.—Dr C. F. A. Pantin, F.R.S., President in the Chair.

The proceedings of the General Meeting held on 2 April 1959, having been circulated, were taken as read and confirmed.

The following signed the Obligation in the Roll and Charter Book and were admitted Fellows : Margaret Florence Mary Garrat, B.Sc. and John Dore, B.Sc., Ph.D.

The President announced that the Council had nominated Professor H. Munro Fox and Professor Carl Skottsberg as recipients of the Linnean Gold Medal for 1959.

The following candidates for Fellowship and ordinary Associateship were balloted for and elected :—

Fellows : V. P. Agrawal, M.Sc.; Agnes Beryl Beakbane, B.Sc., Ph.D.; Kathleen Isabel Margaret Chesters, B.Sc., Ph.D., A.L.S.; William Derek Clayton, B.Sc.; Dorothy Ellis de Vesian, B.Sc.; Major William George Knox Finlay ; Joseph Maskrey Fisher ; Prof. William Whigham Fletcher, B.Sc., Ph.D. ; Philip Ferdinand Gates, B.Sc. ; Simpson Miller Gault ; R. D. E. Jayasekera, M.Sc.; Ian J. Linn, B.Sc.; Charles Francis Akudo Onochie, B.Sc.; Edith Lydia Perry, M.Sc., L.L.A.; John Cowen Raymond ; Reynold Mark Ridgway ; Peter A. Screen, B.Sc.; Anthony John Edwin Smith, B.A.; John Frederick Spilsbury, B.Sc.; Dennis Percival Stanfield ; Trevor George Walker, B.Sc., Ph.D.; Prof. Philip Frank Wareing, D.Sc., Ph.D.; Alan Wesley, B.Sc.; G. V. Wickramasekera ; David Wilkie, B.Sc., Ph.D.; James Sterling Wilkie, B.Sc., Ph.D.; Stanley Reginald John Woodell, B.Sc., Ph.D.

Ordinary Associates :—Edwin Albert Cossins, B.Sc.; Maxwell Dorien Hooper, B.Sc.; Antony Philip Hughes, M.A., Ph.D. and K. L. Mehra, M.Sc.

The following proposed alterations to the Bye-Laws were balloted for and approved :—

Chapt. 14, Sec. 1 (appointment of Committees) line 7 : after the word ' Library ' *add* ' An Editorial Committee (to include the Officers) '.

Chapt. 5, Sec. 9, line 4 : *delete* the words ' of one pound ' and substitute the words ' (see Appendix) '.

Chapt. 2, Sec. 1, line 2 : *omit* the words ' the sum of four pounds for ' and after the word ' Fee ' *add* the words ' (see Appendix) '.

Chapt. 2, Sec. 2, Line 2 : *omit* the words ' of not less than five pounds ' and *replace* with the words ' (see Appendix) ', and *substitute* the words ' the like sum annually ' with the words ' his Annual Contribution '.

Appendix to the Bye Laws: *add* the following before the Table of Composition Fees, etc.

'Admission Fee and Annual Contibutions.'

'The Admission Fee to be paid by Fellows (unless exempt) is four pounds.'

'The Annual Contribution to be paid by Fellows is five pounds.'

'The Annual Contribution to be paid by ordinary Associates is two pounds.'

The following were elected Auditors of the Treasurer's Accounts for 1958–59 under Chap. 10, Sec. 7 of the Bye-Laws:—

For the Council:	*For the Fellows:*
Mr J. P. M. Brenan	Dr M. A. P. Madge
Dr J. P. Harding	Dr E. Trewavas

The following communications were made:—

Dr K. R. Sporne, F.L.S.—Correlation of Biological Characters. (Published, *Proc.*, **171**: 83–88)

Professor H. Grüneberg, F.R.S. (Visitor)—Correlation of Characters in the Mouse.

(Discussed by Dr H. Hamshaw Thomas, the President, The Zoological Secretary, Dr D. W. Tucker, Dr John Smart, Dr A. J. Cain, Mr P. R. Bell, Dr W. B. Turrill, Dr E. Trewavas. Dr R. Melville and the Botanical Secretary. Dr Sporne and Professor Grüneberg replied.)

7 May 1959.—Dr C. F. A. Pantin, F.R.S., President in the Chair.

The proceedings of the General Meeting held on 16 April 1959, having been circulated, were taken as read and confirmed.

The following signed the Obligation in the Roll and Charter Book and were admitted Fellows: Norman Keith Bonner Robson, B.Sc., Ph.D.; Miss Dorothy Ellis de Vesian, B.Sc.; Harold Donovan Tindall, M.Sc.

The following communications were made:—

Mr W. T. Stearn, F.L.S.—The Centenary of Alexander von Humboldt. (Discussed by the President; Mr Stearn replied).

Professor K. Mather, C.B.E., F.R.S. (Visitor)—Variation and selection of the cytoplasm in *Aspergillus*. (Discussed by the President Mr P. R. Bell and Dr Edward Hindle; Prof. Mather replied).

Dr J. A. Roper (Visitor)—Interactions of Nucleus and Cytoplasm. (Discussed by the President and Mr P. R. Bell; Dr Roper replied.)

2. The Anniversary Meeting of the Society on 28th May, 1959.

Dr C. F. A. Pantin, F.R.S., President in the Chair.

The proceedings of the General Meeting held on 7 May 1959, having been circulated were taken as read and confirmed.

The president in drawing especial attention to a portrait of Linnaeus exhibited at the Meeting explained that this was one of three portraits, the others being of Darwin and Wallace, painted by Vladimier Eustaphieff for the Darwin Museum, Moscow and presented by Dr Kohts, the Director, to the British Museum (Natural History). The Trustees had handed the portrait of Linnaeus to the Society on permanent loan, whilst those of Darwin and Wallace had been placed in Down House on permanent loan.

The following signed the Obligation in the Roll and Charter Book, and were admitted Fellows: Edith Lydia Perry, M.Sc.; James Sterling Wilkie, B.Sc., Ph.D.; Philip Ferdinand Gates, B.Sc.; William Derek Clayton, B.Sc.; Major William George Knox Finlay; Joy Etherington, B.Sc.; Anthony John Edwin Smith, B.A.; Stanley Reginald John Woodell, B.Sc., Ph.D.

Candidates for membership were balloted for and elected :—

Fellows: Geoffrey Hill Abraham, M.Sc.; James Eric Adderson, B.Pharm, Ph.C.; Dr Hermann-Heino Heine.

Foreign Member: Professor Dr Jean G. Baer of Neuchatel.

Associate honoris causa: Warren R. Dawson.

The President gave further details of the proposed new Office of Editorial Secretary and appointment of an Editorial Committee, and after the Bye-Laws regulating the Election of Council and Officers had been read by the General Secretary the President appointed Mr R. H. Jeffers, Dr A. Melderis and Dr E. M. Delf as Scrutineers of the Ballot and declared the Ballot for the New Members of Council to be open.

The Ballot was closed at the due time and the result declared to the Meeting. *New Members of Council:* Mr E. J. H. Corner, F.R.S., Dr G. Owen Evans, Mr C. C. Hentschel, Dr A. Melderis and Mr Wm. T. Stearn.

The retiring Councillors were Mr Peter R. Bell, Mr D. Etherington, Sir Frederick Stern, O.B.E., M.C., Dr H Hamshaw Thomas, M.B.E., F.R.S., and Dr Errol I. White, F.R.S.

In handing one of the two Linnean Gold Medals awarded this year to Professor Harold Munro Fox, F.R.S., the President spoke of his outstanding work on the physiological relation of the organism to its environment and in handing the second Linnean Gold Medal to Hr: Claes Carbonnier, Chargé d'Affaires of the Royal Swedish Embassy in London for onward transmission to Professor Carl Skottsberg, who was unable to be present at the Meeting, the President spoke of Professor Skottsberg's great service to the Science of Botany in so many fields of research. (The President's citations are printed in full on pages 165–166.)

The Financial Report was given by the Treasurer and the Accounts of the Society, duly audited, for the year 1958–59 were laid before the Meeting. (See page 166.)

On a motion by Dr Hugh Scott F.R.S., seconded by Mrs Vera Higgins, the Report and Statement of Accounts were adopted.

The General Secretary presented his Report. (See page 168.)

The President declared the Ballot for Officers to be open and voting began.

The Annual Review of the Society's activities was read by the President. (The Review is printed in full on pages 169–171.)

The President then delivered his Address, 'Diploblastic Animals'. (Published, *Proc.*, **171**: 1–14.)

On its conclusion, Dr John Ramsbottom, O.B.E. moved, 'That the President be thanked for his excellent Address, and that he be requested to allow it to be printed and circulated amongst the Fellows'. The motion was seconded by Dr H. Hamshaw Thomas, M.B.E., F.R.S., and being put to the Meeting was carried with acclamation.

The result of the Ballot for Officers was declared to the Meeting; *President:* Dr C. F. A. Pantin, F.R.S.; *Treasurer:* The Rt Hon. The Earl of Cranbrook, C.B.E.; *Zoological Secretary:* Mr H. R. Hewer, O.B.E.; *Botanical Secretary:* Dr C. R. Metcalfe and *Editorial Secretary:* Dr John Smart.

The President announced that he would appoint the following as Vice-Presidents for the Session 1959–60: Professor L. J. Audus, The Earl of Cranbrook, Mr A. W. Exell and Dr H. G. Vevers.

The President declared the business of the Anniversary Meeting completed and declared the Session ended.

3. Extraordinary Meetings of the Society, Symposia Organized by the Society's Specialist Groups, etc.

10 October 1958. A special meeting of the Plant Anatomy Group; the following papers were read:—

Dr C. R. Metcalfe, Sec. L.S.—Aims and Objects of the Plant Anatomy Group.

Mr B. J. Rendle (Visitor)—Some Internal Factors Causing Variation in Wood Anatomy.

Dr L. Chalk, F.L.S.—Variation within the Ring.

Dr A. B. Beakbane (Visitor)—Some Causes of Variation in the Anatomy of Clonal Fruit Plants.

Professor R. D. Preston, F.R.S. (Visitor)—Variations in Anatomy and Some Associated Physical Conditions.

Dr M. L. R. Pettersson, F.L.S.—Quantitative Variation and Causal Factors, with Special Reference to Position and Altitude.

Dr C. R. Metcalfe, Sec. L.S.—Some Examples of Anatomic Variation.

Mr P. R. Bell, F.L.S., summarized the day's papers and discussion.

25 October 1958. A special Palaeobotanical meeting at which papers were read by:—

Dr H. Hamshaw Thomas, M.B.E., F.R.S., V-P.L.S.—Introduction.

Mrs E. Plumstead—The Fructification and Growth Habits of the Glossopteridae.

Mr Alan Wesley—Some Problems Arising from Investigation of the Jurassic Flora of Northern Italy.

Dr W. G. Chaloner & Dr J. Lorch—A Preliminary Report on Jurassic Conifers from Israel.

Mr P. Barnard—On the Megaspore Membrane of *Eosperma oxroadense*, a New Lower Carboniferous Seed.

4 December 1958. The adjourned meeting of 20 November was resumed for the purpose of holding an Exhibition Meeting during the evening of Thursday 4 December 1958. The following exhibited:—

Dr Anna Bidder, F.L.S. Cephalopods. Mr F. N. Hepper, F.L.S. Some wild 'groundnuts' from West Africa. Mr C. E. Hubbard, O.B.E., F.L.S. Flowering specimens of the Bamboo *Arundinaria fastuosa* Mitford. Dr I. Gordon, F.L.S. Two new Cavernicolous crustacea. Mr F. Richardson. Method of reviving sections of compressed wood from archaeological sites and peat bogs for microscopical examination. Dr R. Melville, F.L.S. & Mr J. E. S. Souster, F.L.S. Morphology and Evolution of the Phyllodes of *Acacia* species. Miss P. M. Taylor, F.L.S. 'Illustrations of the Principal Natural Orders of the Vegetable Kingdom' by Prof. D. Oliver. Mr J. P. Evenson, F.L.S. & Mr F. F. Spilsbury. Experimental Hybridization in *Digitalis*. Dr M. Y. Stant. Plant Irradiation. Growth of Tropical plants under electric light. Dr S. M. Manton, F.R.S., F.L.S. A simple method for inspecting the trunk musculature of small arthropods. Dr J. Ramsbottom, O.B.E., F.L.S. (*a*) Linnaeana. (*b*) An interesting Fungus. Dr T. D. V. Swinscow, F.L.S. & Mr

A. C. JERMY, A.L.S. Three Lichens new to the British Isles. Dr H. G. VEVERS, M.B.E., F.L.S. Chameleons from the Collection of the Zoological Society of London. The Director; Mr F. BALLARD and other members of the staff of the Royal Botanic Gardens, Kew. Living specimens of Ferns and Fern Allies. Mr Eric M. MARSDEN-JONES, F.L.S. The life-cycle of *Adleria kollari* Hartig, the Marble or Devonshire Gall. Dr D. H. Dalby. Pores and fibrils in *Sphagnum*.

19–20 December 1958. A symposium on 'Experimental Approaches to the Problems of Growth and Form in Plants', organized by the Experimental Plant Morphology Group of the Society. The papers read have since been collected and published in *J. Linn. Soc.* (*Bot.*) **56** (366) : 153–302 ; 1959.

Chairmen of the sessions were :—The President, Dr C. F. A. PANTIN, F.R.S.; Dr H. HAMSHAW THOMAS, M.B.E., F.R.S., V.-P.L.S.; Dr C. R. METCALFE, Sec. L.S.; Professor L. J. AUDUS, F.L.S.; Mr P. R. BELL, F.L.S.

The following were the speakers and the titles of their papers :—

Professor C. W. Wardlaw—Experimental Techniques in Plant Morphogenesis. Dr A. P. Hughes—Effects of Environment on Leaf Development in *Impatiens parviflora*. Mr A. Booth—Some Factors affecting the Production of Stolons in the Potato. Dr G. R. Lane & Mr R. D. Butler—The Study of Apical Development in Relation to Etiolation. Professor L. J. Audus—Correlations. Mr P. R. Bell—The Experimental Investigation of the Pteridophyte Life-cycle. Dr E. M. Burrows—Growth Form and Environment in *Enteromorpha*. Dr N. Robertson—Experimental Control of Hyphal Branching and Branch Form in Hyphomycetous Fungi. Dr J. H. Tallis—Periodicity of Growth in *Rhacomitrium lanuginosum*. Dr E. Lodge—Effects of Certain Cultivation Treatments on the Morphology of Some British Species of *Drepanocladus*. Dr E. G. Cutter & Mr B. R. Voeller—Changes in Leaf Arrangement in Individual Fern Apices. Dr P. W. Brian, F.R.S.—Morphogenetic Effects of Gibberellic Acid. Dr M. Y. Stant—Some Growth Responses to Gibberellic Acid. Professor F. G. Gregory, F.R.S. & Dr Olive N. Purvis—The Effect of Very Long Days on the Flowering of Winter Rye. Dr W. W. Schwabe—Some Effects of Environment and Hormone Treatment on Reproductive Morphology in *Chrysanthemum*. Dr F. Cusick—Floral Morphogenesis in *Primula bulleyana*. Professor J. Heslop Harrison—Growth Substances and Flower Morphogenesis. Professor P. F. Wareing—Problems of Juvenility and Flowering in Trees. Dr Y. Heslop Harrison & Miss I. Woods—Temperature Induced Meristic and Other Variation in *Cannabis*. Dr L. C. Luckwill—Factors Controlling the Growth and Form of Fruits.

6 March 1959. A symposium on 'Experimental Taxonomy of Vascular Plants', organized by the Experimental Plant Taxonomy Group of the Society. (The papers read have since been collected and published in *Proc.* **171** : 122–133).

Chairmen :—Sir FREDERICK STERN, O.B.E., M.C., V.-P.L.S., and Mr PETER R. BELL, F.L.S.

The following were the speakers and the titles of their papers :—

Prof. D. H. Valentine, F.L.S.—Introduction. Dr D. A. Wilkins—Recognizing Adaptive Variants—Illustrated by Lead Tolerance in *Festuca ovina*. Dr J. D. Lovis—*Asplenium trichomanes* : A Problem in the Taxonomy of Polyploids. Dr S. Walker—Evolution within the Genus *Dryopteris*. Miss J. Buchanan—A re-examination of *Luzula campestris* s.l. Dr J. Savidge—The Experimental Taxonomy of European *Callitriche*.

The General Discussion was opened by Dr V. H. Heywood, F.L.S. and the following participated :—Mr J. S. L. Gilmour, F.L.S., Dr R. Melville, F.L.S., Dr Lovis, Mr R. Ross, F.L.S., Professor R. E. Holttum, F.L.S., Dr S. Max Walters, F.L.S., Professor H. R. Hewer, F.L.S., and Mr H. White ; Dr Heywood summed up the discussion.

21 March 1959. A meeting under the chairmanship of Professor T. M. Harris F.R.S. to consider technical questions relating to the nomenclature of botanical fossils, organized by the Palaeobotany Group of the Society.

24 April 1959. A symposium on ' Comparative Studies in Ultrastructure ', held in the Lecture Theatre of the British Museum (Natural History) (by courtesy of the Trustees) Dr C. F. A. PANTIN, F.R.S., President, in the Chair. The following were the speakers and titles of their papers :—

Introduction by the President. Dr George E. Palade—Ribonucleoprotein Particles of the Cytoplasm. Dr Sanford L. Palay—Comparative Studies of Cytoplasmic Particles of Cells. Dr J. Hanson, Dr H. E. Huxley & Dr J. Lowy—Comparative Studies in the Contractile Structures of Smooth and Striated Muscle. Mr Andrew F. Huxley F.R.S.—Comparative Study of the Activation of Contraction in Muscle.

A discussion followed.

13 May 1959. An additional meeting, under the chairmanship of the President, Dr C. F. A. PANTIN, F.R.S. when Dr HANS HELBAEK of Copenhagen addressed the Society on :—

' Archaeology and the Evolution of the Cultivated Plants, with Special Reference to *Linum*.'

22 May 1959. A symposium organised by the Plant Anatomy Group of the Society on ' The Role of Plant Anatomy and Applied Botany ' at East Malling Research Station.

The programme included visits to the laboratories and orchards to see the work being carried out at East Malling.

23 July 1959. Dr C. F. A. PANTIN, F.R.S., President, in the Chair.

The Meeting was arranged to allow Members of the Staff of the Imperial College of Tropical Agriculture, Trinidad, on leave in the United Kingdom, to speak to the Society.

The following signed the Obligation in the Roll and Charter Book and were Admitted Fellows :—James Eric Adderson, B.Pharm., Ph.C., and Charles Francis Akudo Onochie, B.Sc.

The following Communications were made and discussed :—

IMPERIAL COLLEGE OF TROPICAL AGRICULTURE, TRINIDAD.

Teaching and Research.

Dr G. A. C. HERKLOTS, F.L.S. (Principal and Director)—Introduction.

Professor J. W. PURSEGLOVE, F.L.S.—Woods in Tropical Pastures.

Mr P. N. WILSON—Animal Behaviour in the Wet Tropics.

Mr M. H. BREESE—The Infestability of Unhulled Rice.

Discussed by the President, Mr E. J. H. Corner, Prof. K. N. Kaul, Prof. J. W. Purseglove, Mr P. N. Wilson, Dr J. Dore, Prof. T. Thomson Flynn and Mr W. T. Stearn.

PRESENTATION OF LINNEAN GOLD MEDALS: 1959

In handing one of the two LINNEAN GOLD MEDALS awarded this year to Professor Harold Munro Fox, F.R.S., the President spoke of his outstanding work on the physiological relation of the organisation to its environment, and in handing the second LINNEAN GOLD MEDAL to Hr: Claes Carbonnier, Chargé d'Affaires of the Royal Swedish Embassy in London, for onward transmission to Professor Carl Skottsberg, who was unable to be present at the Meeting, the President spoke of Professor Skottsberg's great service to the Science of Botany in so many fields of research.

Professor Harold Munro Fox: The last 50 years have seen immense advance in the physiological and biochemical analysis of living machinery. Much less work has been done on the physiological relation of the organism to its environment. In this, more difficult, field, your contribution, Sir, has been outstanding. Your work upon the function of the peculiar respiratory pigments of sedentary polychaete worms and the more recent studies of the manufacture of haemoglobin by Cladocera and upon the controlled production of this pigment to meet the respiratory requirements of the environment, are clear illustrations of the physiological basis of adaptation, upon which evolution depends. Similarly, studies of the effect of temperature upon animals have defined the relation of that influence to the normal temperature range of the animal and to its geographical latitude. Again, you and your students have made classical investigations upon the relation of the metabolism of aquatic animals to the speed of the streams which they inhabit. Your comprehensive approach to biology is such that I believe we may soon look forward to the publication of a great work on the pigments of the animal kingdom.

From the first early demonstration of lunar periodicity in marine animals to your most recent work, the animal has always been a living creature in the natural world rather than a mere collection of tissues in the laboratory.

Apart from the influence of your own research on that of so many students, biologists throughout the world owe you a lasting debt as editor of that splendid journal, the *Biological Reviews*. Not only do we look to it for guidance to keep us abreast of every field of biological science, but many of us as contributors know the value of your wise advice, encouragement and wide knowledge.

This medal is a token of our admiration for your work.

To our great regret **Professor Carl Skottsberg** cannot be with us today, but we have pleasure in inviting Mr Carbonnier, Chargé d'Affaires of the Royal Swedish Embassy, to receive the medal on his behalf.

During the past session the members of the Society have been remembering the work of Darwin and of Wallace, and also the explorations of Alexander von Humboldt. Professor Skottsberg was inevitably among the several distinguished men whom we honoured last July. But today we wish to do him especial honour as a very great botanist; one who has travelled widely in South America and contributed so much new information about the vegetation of the southern part of that area.

Professor Skottsberg has been described by one of his distinguished fellow-countrymen as the most widely travelled of all Swedish botanists, and the list of his publications shows the remarkable extent of his studies. He has made noteworthy contributions to phytogeography, ecology and taxonomy; to morphology, floral biology and to our knowledge of the brown and red algae. In the field, in addition to flowering plants and gymnosperms and ferns he has collected bryophytes and lichens.

Like Darwin his first important expedition was to circum-antarctic regions. In spite of the discomforts and dangers on that occasion, when his ship was caught in the ice, he returned several times to collect specimens and photograph the vegetation. So we obtained reliable and detailed accounts of the

vegetation of Patagonia, Tierra del Fuego and the Falkland Islands, later of the plants of Chile and the Western Cordilleras of the Andes, of Juan Fernandez and Easter Island. Professor Skottsberg's interest in island life led him to New Zealand, Australia and New Caledonia, and to most important studies of the plants of the Hawaiian Islands. He thus extended the work begun by Sir Joseph Hooker, who was the first botanist to receive the Linnean Medal from the Society.

In his own country Professor Skottsberg has done notable work in founding and directing a Botanic Garden of outstanding interest at Gothenburg, and as Professor at the University College. With his wide interests and extensive travels he has been active in promoting international friendship, especially between Sweden and the English-speaking people, and this medal is a token of our estimate of his service to science.

Sir, I ask you to give this to him.

TREASURER'S REPORT
1958–59

The printed copies of the Accounts now before you cover the year ended 31 March 1959. The comparison figures printed in italics on the left are *for 11 months only*. A Statement has been prepared by the Auditors who certify as to details, the Audit Committee has inspected the books, verified the investments and Bank Balances and passed the Accounts; the action of the Committee has been confirmed by the Council.

Herewith a brief account of the main items :—

On the Receipt Side

Annual Contributions are a little higher than last year. The limit to the number of Fellows that may be elected is 1000. The present number is 861 and the last year has shown a slight increase in Fellowship. A substantial increase in the number of Fellows to a figure nearer the limit would be of great assistance to the Society's finances.

Income Tax on Deeds of Covenant.—Income Tax received under Deeds of Covenant does not appear in these Accounts, but I am happy to say that our outstanding claim of £400 for 1955–56 has now been paid, and we are now submitting further claims for the financial years 1956–57, 1957–58 and 1958–59 amounting to approximately £1200. Payment by Fellows of their Annual Contributions under Deed of Covenant is of substantial benefit to the Society, and it is hoped that as many Fellows as possible will undertake to pay their Annual Contributions in this way.

Interest and Dividends.—Much lower than the previous year mainly due to less money being on deposit in the various Accounts, and the substantial reduction since last year of the deposit interest rate.

Composition Fees.—A little above receipts of last year (£144 of this still to be invested).

Sales of Publications.—The figure of £3136 is £1100 above the record figure of £1988 in 1956–57. A substantial part of these receipts was however from the double sale of the joint botanical and zoological Darwin-Wallace Centenary Journal.

Donations.—We are very grateful to our Foreign Member, Dr B. O. Dodge, for his gift of $100 towards the General Purposes Expenses of the Society.

Grants for Publications.—We are greatly indebted to the Council of the Royal Society for the grant of £1000 from the Parliamentary Grant-in-aid towards the cost of the Society's Publications and to Dr Hugh Scott, F.R.S., F.L.S., for paying the major part of the cost of his paper in the Society's *Proceedings*, **170**.

Transfer from Reserve Funds.—To meet the cost of Publications it was necessary to withdraw £500 from the Reserve for Publications Fund, and the balance of this Reserve is now reduced to £2040.

Sale of Investments.—I will give details of these later.

On the Payment Side

Electricity, Gas and Fuel.—Are about the same as last year, taking into consideration that the period is for 12 months.

Furniture and Repairs.—Is again a substantial figure due to the redecoration of the Housekeeper's flat and the Annexe to the Meeting Room.

Miscellaneous Printing and Stationery and Dispatch.—About the same as last year having regard to the period of 12 months.

Miscellaneous Expenses and Postages.—Much higher due mainly to the postages on increased sales of publications and for additional Meetings of the Society.

Publications.—This figure is well above the average but includes the cost of the special Darwin-Wallace Centenary Journal.

Salaries, Wages and Pensions.—£100 higher on 12 months basis.

Linnean Medal.—Double last year's figure as two medals were awarded.

Purchase of Investments.—I will speak of these later.

Library Fund

We are grateful to the John Innes Horticultural Institution and Imperial Chemical Industries Ltd for their annual donations and to the Ray Society for their gift of £50 for the use of the Society's copy of the *Species Plantarum* for their facsimile reproduction of this work. We are also very grateful to the Royal Society for their grant of £650 towards the cost of the Society's arrears of Library bindings and repairs. You will see that we received £2880 from the sale of surplus Library periodicals, and this amount together with the £100 received last year has been invested.

Library Restoration Fund

Very little has been received in gifts this year, and it is hoped that Fellows and Friends will continue to give this Fund all the support they can by gifts and legacies.

Of the balance of £1838, £1000 has been earmarked for the repair of books in Linnaeus's library, £400 is a grant from the Royal Society for the purchase of arrears of German Periodicals and £100 a gift from His Majesty The King of Sweden for reboxing the Linnean MSS.

The Fellows Postal Account is self explanatory.

The Trust and Reserve Funds

The £410 received from the Royal Society as a capital loan towards the cost of producing the Darwin-Wallace Commemoration Journal has been refunded to the Royal Society since these Accounts were printed, as the sales of that Journal have covered the cost of its printing.

The Darwin-Wallace Celebrations Reserve Fund

Reduced to £114 and next year this will be written into the General Account income to offset the original expenditure on the die of the Medal and the making of the Silver Presentation Medals and Bronze replicas.

Investments

General Account

There have been considerable changes in the investments held by the Society. Those gilt-edged fixed interest stocks in the General Account which

were close to their redemption date and stood at near par were sold and the money invested in equities, while the whole of the money received from the sale of surplus periodicals (£2977) was similarly invested for the Library Account. Most of the money was put into investment trusts since that seemed the best way of getting a wide spread for a relatively small amount of capital. About 60 per cent of the Society's money remains in fixed interest securities, possibly still too high a proportion at a time of continuing inflation.

The following investments were sold:—

£2199.18.6	4 per cent Australia Stock 1961–64
£ 200. 0.0	3 per cent War Stock 1955–59
£ 498.15.9	4½ per cent Conversion Stock 1962
£ 105. 0.0	4½ per cent Conversion Stock 1962

and the following were purchased:—

£275.0.0	Barclays Bank Ltd. Ordinary Stock
100	The Employers' Liability Assurance Corp. Ltd £1 shares fully paid
£ 25.0.0	The Globe Telegraph and Trust Co. Ltd Ord. Stock
£ 34.0.0	Lonsdale Investment Trust Ltd Ord. Stock
1927	Peninsular Investment Co. Ltd 5*s*. shares fully paid
600 units	The Pension (Equities) Unit Trust Fund

Library Account

The following investments were purchased with the money received from the sale of surplus periodicals:—

£195. 0.0	Glasgow Stockholders Trust Ltd Ord. Stock
£325. 0.0	The Globe Telegraph and Trust Co. Ltd Ord. Stock
£255. 0.0	Lonsdale Investment Trust Ltd Ord. Stock
575	Peninsular Investment Co. Ltd 5*s*. shares fully paid
£138.15.0	The Scottish National Trust Co. Ltd Ord. Stock.

Special Accounts

No sales or new investments have taken place in these Accounts. The only change being the investment of the income of the Staff Pension Fund.

I should like to thank our General Secretary, Mr T. O'Grady and our Clerk, Mrs E. Zeigler for the excellent manner in which the accounts have been kept and for the conscientious way in which the work has been done.

GENERAL SECRETARY'S REPORT 1958–59

List of the Society

Since the last Anniversary Meeting the Society has lost 32 members. The detailed statement is as follows:—

19 *Fellows by Death*:

Montagu Charles Allwood.
Angus Herdman Booth.
Rex Alan Henry Graham.
Cyril Francis Hill.
Arthur Samuel Horne.
Florence Annie Mockeridge.
Ernest Nelmes.
Richard Neville Parker.
Sir Ralph Sneyd Pearson.
Harold Vincent Rose.
George Osborne King Sainsbury.
Elsie Wilkins Sexton.
Malcolm Arthur Smith.
Thomas Archibald Sprague.
William Stone.
Marie Charlotte Carmichael Stopes.
Lord Strathcona and Mount Royal.
Bertram Hammer Bunbury Symons-Jeune.
Henry Newcome Wright.

2 *Associates* honoris causa *by death*:

John William SAUNT. Ernest William SWANTON.

1 *Foreign Member by death*:

Maurice CAULLERY.

7 *Fellows by Withdrawal*:

Ronald Goulding ATKINSON.
Alfred Cecil CRAMP.
T. H. GOODSPEED.
Frederick Cyril GRIGG.
Richard Wheeler HAINES.
Edmund James KING.
John Dudley ROMER.

3 *Fellows by Removal for Non-Payment of Annual Contributions in Accordance with Bye-Laws, Chapter 2, Sect. 4*:

Mahmoud Ahmed MELOUK.
Roland Mark UNDERHILL.
Sanya Dojo ONABAMIRO.

During the Session 50 Fellows, 1 Foreign Member, 1 Associate *honoris causa* and 7 Ordinary Associates have been elected. The number of Fellows on the List is 855 with a further 6 Fellows elected but still to qualify; Foreign Members 50, Associates *honoris causa* 24, and ordinary Associates 19; 5 ordinary Associateships have expired during the year of which 1 has been elected Fellow.

The Library

Between 1 May 1958 and 30 April 1959, 33 works have been purchased; 64 books, 184 parts of periodical publications and 134 reprints have been presented. During the same period the number of volumes bound was 400; the number of volumes borrowed was 612. Six hundred and eighty-two signatures were recorded in the Library Visitors Book.

THE PRESIDENT'S ANNUAL REVIEW

The SECOND year in succession has been one of celebration for our Society. After the birth of Linnaeus there is no greater event for us than the communication by Charles Darwin and Alfred Russel Wallace of their theory of evolution by natural means of selection. We marked the precise centenary, 1 July 1958, by the unveiling of the plaque you see on the wall below our splendid picture of Charles Darwin. The numerous and distinguished audience included many members of the families of the men we honoured. Afterwards a dinner was held in the Draper's Hall. It was a most pleasant and graceful occasion.

The celebration was continued on 15 July. By kind permission of the Royal Geographical Society a special meeting was held in their Memorial Hall. Twenty silver Darwin-Wallace medals were presented to botanists and zoologists of world-wide distinction. The same meeting commemorated the bicentenary of the publication of the tenth edition of the *Systema Naturae* of Linnaeus. Dr A. Tindell Hopwood and Dr Arthur Cain addressed the large and international audience on Pre- and Post-Linnaean Taxonomy.

That evening, in conjunction with the Royal and the Geological Societies of London, we gave a great reception here in Burlington House. The rooms of the various Societies held a most interesting exhibition of objects relating to Darwin and to Wallace. Many will remember the beautiful portrait of Charles Darwin as a young man, exhibited in this room through the kindness of his grandson Sir Charles Darwin. We are most grateful to all those who kindly lent their treasures for the Reception. An exhibit of special interest was the skin

of a large Malayan python whose capture is vividly described by Wallace, and in his own words was 'capable of doing much mischief and of swallowing a dog or a child'. The snake skin has been generously presented to the Society by Mr A. J. R. Wallace.

I had also hoped to be able to tell you today of the acquisition of another piece of Wallaciana. On 14 April the manuscript of Wallace's remarkable address to the Linnean Society in 1909 came up for auction at Sotheby's, together with various documents relating to Darwin. Particularly through the generous support of the Pilgrim Trust and the interest of Sir Gavin de Beer we were able to make a very substantial bid; but we were quite outclassed by a transatlantic bookseller at £1000. Bearing in mind recent sales in the artistic world, we must perhaps consider such prices as less unrealistic than they would seem—and sharply reconsider the value of the great treasures already in our possession.

The year which opened with celebration has brought much hard work to your Council. Under the wise guidance of our Treasurer we have reviewed and revised our investment policy: and we would congratulate him in that when all but hope had fled he has snatched victory from the Inland Revenue over the matter of Covenanted Subscriptions. It is a matter of no small satisfaction that the stand taken by our Society has not only benefited ourselves but has set a precedent valuable to other learned bodies. Refund of the tax on our covenanted subscriptions is again allowed to the Society. That at once brings us a substantial benefit by what I suppose is today called the de-freezing of assets: it will bring us still more if we all allow ourselves to be persuaded by the Treasurer's recent circular to enter into covenanted subscriptions to the benefit of the Society.

But the most serious problems before Council have concerned the Library and our system of publication. Increase of costs and the difficulties of the war years gave sad blows to our Library. It has been necessary to make a thorough analysis of the position. As a result we have been able to go to the Royal Society with a clearly documented case for help over repairs and arrears of binding and they have been good enough to make us a grant of £650 for this from Government Funds. It has also enabled us to approach the Nuffield Foundation for an interesting venture. They have generously agreed to provide a loan of £600 to finance the photographic reproduction by the Society of the Linnaean Herbarium. The International Documentation Centre, Stockholm, will distribute this for the Society on advantageous terms to us. The negatives will remain the property of the Society.

For some time it has become evident that our method of publication of our Journals should be brought into line with modern practice. An efficient scientific Journal today is expected to publish regularly at fixed times in the year and to ensure that manuscripts received shall be refereed and published speedily. At present publication is still but one of many duties of the Secretaries and Council. Thorough consideration of this matter resulted in the recommendations recently passed by the Society. The most important of these is the appointment of an Editorial Committee and an Editorial Secretary, whose prime duty will be to ensure rapid and regular publication of scientific matter of the highest quality.

But the most important activity of the Society is neither celebration nor administration; it is the scientific work we do. Besides our 13 general meetings, we have held no fewer than ten special meetings this year, perhaps a record number. Specialist group meetings in Plant Anatomy and Palaeobotany have been held, and Symposia on Experimental Plant Morphology, Experimental Plant Taxonomy and Comparative Studies of Ultrastructure,with particular reference to nerve and muscle. It is noteworthy that one of our Plant Anatomy

meetings was held recently at the East Malling Research Station by invitation of Dr F. R. Tubbs, the Director, who is one of our Fellows. It is believed that this is the first occasion for a meeting of the Society to be held outside London. There is no doubt that these Symposia and special meetings are a success and that biologists are beginning to look to our Society to provide surveys of current activity over a wide scientific field; and to provide them in language which the ordinary biologist has some chance of understanding. Indeed the success of these meetings raises problems about the organization of the annual programme.

Our General Meetings have been as interesting as they have been varied. Among so many things, I recall with particular pleasure Dr Hamshaw Thomas's paper on Angiosperm Evolution. That was in fact the substance of the Presidential Address which ill health had prevented him from delivering last year.

The Exhibition Meeting in December was well attended, and we would congratulate the exhibitors on the quality of their demonstrations and would thank them for the care and trouble they took.

It will be recalled that, for several years, the Society has sponsored the proposal by a small group of our Fellows, with collaboration from botanists on the European Continent, to produce a *Flora Europaea*. It is a pleasure to record that a very successful meeting of those who are concerned with this undertaking was held in Vienna in April.

At its meeting on 19 March Council received with regret the resignation of Mr N. Y. Sandwith from the office of Botanical Curator of the Linnaean Collections. We wish to thank him most warmly for all he has done for us. Mr Wm. T. Stearn has been appointed to succeed him.

We have had a successful and very busy year. A quite unusually large amount of work has fallen upon our General Secretary and staff. That they have undertaken so much for us with willingness and efficiency has earned for them the gratitude of the Society. They have enabled us to follow the words of our statute and to cultivate 'natural history in all its branches'. I know that I speak for the entire Fellowship when I thank them whole-heartedly for what they have done.

General

1957–58 (11 months) £	RECEIPTS	£ s. d.	1958–59 (12 months) £ s. d.
	To Balance at 1 April 1958 :—		
	Current Account at Bank	115 1 9	
	Deposit Account at Bank	709 11 0	
	Deposit Account Post Office Savings Bank	24 6 10	
	Cash in hand	5 12 0	
1577			854 11 7
76	,, Admission Fees		80 0 0
	,, Arrears of Annual Contributions	163 1 1	
	,, Annual Contributions—Current	3377 13 1	
	,, ,, ,, —in advance	104 18 2	
3492			3645 12 4
15	,, Annual Contributions of Associates		8 0 0
410	,, *Grant—Royal Society (Darwin-Wallace Journal)*		—
204	,, Composition Fees		234 10 0
613	,, Dividends on Investments and Deposit Account Interest		500 4 10
24	,, Interest on Post Office Savings Bank Account		2 0 6
	,, Sales of Publications :—*		
	Transactions	65 7 9	
	Journals	2560 3 6	
1480	Proceedings, etc.	511 4 3	
—	,, Grants in aid of Publications :—		3136 15 6
—	Royal Society	1000 0 0	
	Dr. Hugh Scott	500 0 0	
			1500 0 0
—	,, Donations :—		
	Dr. B. O. Dodge	35 9 1	
—	Sundry	10 0	
			35 19 1
136	,, Miscellaneous Receipts		199 3 6
	,, Transfer from Reserve Funds :—		
—	Reserve for Publications Fund	500 0 0	
250	*Redecorations and Improvements*	—	
55	*Darwin-Wallace Memorial Plaque*	—	
			500 0 0
—	,, Proceeds of sale of Investments		2898 9 0
8332			£13595 6 4

* Not including Publications sent on Exchange : estimated cost price £850.

Library

£		£ s. d.	£ s. d.
126	To Balance at 1 April 1958		212 0 5
64	,, Interest on Investments		118 15 5
10	,, Donations : John Innes Horticultural Institution ..	10 0 0	
—	Ray Society	50 0 0	
—	Imperial Chemical Industries Ltd.	21 0 0	
			81 0 0
500	,, Transfer from General Account	500 0 0	
150	,, ,, ,, *Library Restoration Fund*	—	
			500 0 0
—	,, Royal Society Grant—Binding and Repairs		650 0 0
100	,, Sale of Surplus Library Books		2880 0 0
950			£4441 15 10

Library

£		£ s. d.	£ s. d
1561	To Balance at 1 April 1958		1833 18 3
400	,, Donations : *Royal Society (for German Periodicals)* ..	—	
22	Fellows	5 0 0	
			5 0 0
1983			£1838 18 3

Fellows' Postal

£		£ s. d.
29	To Balance at 1 April 1958	29 1 3
3	,, Deposits	10 18 6
32		£39 19 9

(Presented at the Anniversary Meeting, 28 May 1959)

from 1 April 1958 to 31 March 1959

Account

1957–58 (11 months) £	Payments	£ s. d.	1958–59 (12 months) £ s. d.
243	By Electricity, Gas and Fuel		299 10 0
557	,, Furniture and Repairs		428 7 9
46	,, Fire Insurance		46 10 0
347	,, Miscellaneous Printing and Stationery and Dispatch		373 15 4
373	,, Miscellaneous Expenses and Postages		479 19 9
194	,, *Reception—Linnaeus Birth, 250th Anniversary*		—
	,, Publications :—		
	Printing	4484 13 9	
	Distribution	232 0 9	
	Illustrations	324 12 10	
1597			5041 7 4
400	,, Transfer to *Reserve for Publications Fund*	—	
410	*Darwin-Wallace Journal*	—	
500	Library Account	500 0 0	
			500 0 0
2011	,, Salaries, Wages and Pensions		2358 14 3
44	,, National Insurance		60 4 8
58	,, Staff Annuities (Annual Premium)		58 0 0
15	,, Donations : Zoological Record	15 0 0	
2	International Union for Nature Protection	2 2 0	
5	*Tansley Memorial Stone*	—	
			17 2 0
—	,, International Assoc. for Plant Taxonomy—Subscription		3 10 0
21	,, Linnean Medals		42 10 0
55	,, *Darwin-Wallace Memorial Plaque*		—
600	,, Purchase of Investments (Including £90 8*s.* 9*d.* Investment of Compounders' Fees)		2975 10 10
	,, Balance at 31 March 1959 :—		
	Current Account at Bank	225 10 9	
	Deposit Account at Bank	609 11 0	
	Deposit Account Post Office Savings Bank	26 7 4	
	Cash in hand	35 8 5	
	Capital Cash with Stockbrokers	13 6 11	
854			*910 4 5
8332			£13595 6 4

* Includes £144 1*s.* 3*d.* balance of Composition Fees to be Invested.

Account

£		£ s. d.	£ s. d.
296	By Periodicals*		306 19 3
345	,, Binding		280 8 0
97	,, Books		188 8 10
—	,, Purchase of Investments		2977 8 9
212	,, Balance at 31 March 1959	685 19 9	
—	Add Capital Cash with Stockbrokers	2 11 3	
			688 11 0
950			£4441 15 10

* Not including publications received in exchange ; estimated purchase price £950.

Restoration Fund

£		£ s. d.	£ s. d.
150	By *Transfer to Library Account (Binding)*		—
	,, Balance at 31 March 1959 :—		
	Current Account at Bank	59 13 9	
	Deposit Account at Bank	1721 13 8	
	Deposit Account Post Office Savings Back	57 10 10	
1833			1838 18 3
1983			1838 18 3

Account

£		£ s. d.
3	By Postage on Library Books	3 2 9
29	,, Balance at 31 March 1959	36 17 0
32		£39 19 9

Special Accounts

(Trust and Reserve Funds)

Receipts

	£	s.	d.	£	s.	d.
To Balance at 1 April 1958 :—						
Westwood Fund	111	16	4			
Trail Award Fund	15	8	7			
Crisp Award Fund	30	12	4			
Hooker Lecture Fund	193	6	3			
Goodenough Fund	57	3	5			
Minchin Fellowship Fund	7	10	5			
Carnegie Corporation Grant	419	3	7			
Reserve for Publications Fund	2540	5	3			
Reserve for *Berberis* Monograph (including Royal Society Grant, £500)	750	0	0			
Grant for *Berberis* Monograph (Royal Horticultural Society)	250	0	0			
Darwin - Wallace Celebrations, 1958	195	0	0			
Darwin-Wallace Journal	410	0	0			
				4980	6	2
,, Interest In Investments (gross) :—						
Staff Pension Fund	11	3	6			
Westwood Fund	10	17	4			
Trail Award Fund	3	11	6			
Crisp Award Fund	13	19	0			
Hooker Lecture Fund	21	18	0			
Goodenough Fund	8	12	8			
Minchin Fellowship Fund	3	0	0			
				73	2	0
				£5053	8	2

Payments

	£	s.	d.	£	s.	d.
By Staff Pension Fund :—						
Purchase of £12 4*s.* 8*d.* 3 per cent Savings Bonds 1955–65				11	3	6
Hooker Lecture Fee 1958				26	5	0
Hooker Lecture Printing				115	9	10
Minchin Fellowship Fund-transfer to Annual Contributions				10	0	0
,, Transfer to General Account from :—						
Reserve for Publications Fund				500	0	0
,, Darwin-Wallace Celebrations 1958 :—						
Expenses	590	15	1			
Less Miscellaneous Receipts	510	5	10			
				80	9	3
,, Balance at 31 March 1959 :—						
Westwood Fund	122	13	8			
Trail Award Fund	19	0	1			
Crisp Award Fund	44	11	4			
Hooker Lecture Fund	37	9	5			
Goodenough Fund	65	16	1			
Minchin Fellowship Fund		10	5			
Carnegie Corporation Grant	419	3	7			
Reserve for Publications Fund	2040	5	3			
Reserve for *Berberis* Monograph (including Royal Society Grant, £500)	750	0	0			
Grant for *Berberis* Monograph (Royal Horticultural Society)	250	0	0			
Darwin - Wallace Celebrations, 1958	114	10	9			
Darwin-Wallace Journal	410	0	0			
				*4310	0	7
				£5053	8	2

*Includes £4176 5*s.* 10*d.* Deposit Account at Bank.

Investments on *31 March 1959*

£	s.	d.	
			General Account
1548	8	9	British Transport 3% Guaranteed Stock 1978–88.
3260	1	3	2½% Consolidated Stock.
1000	0	0	4½% Defence Bonds.
1000	0	0	3½% London County Consolidated Stock 1958–68.
1139	13	0	3% Savings Bonds 1955–65.
176	19	3	3% Savings Bonds 1960–70.
274	5	5	3% Treasury Stock.
1172	6	3	3½% War Loan 1952 or after.
275	0	0	Barclays Bank Ltd. Ordinary Stock.
100			The Employers' Liability Assurance Corp. Ltd. £1 shares fully paid.
25	0	0	The Globe Telegraph and Trust Co. Ltd. Ord. Stock.
34	0	0	Lonsdale Investment Trust Ltd. Ord. Stock.
1927			Peninsular Investment Co. Ltd. 5*s*. shares fully paid.
600 units			The Pension (Equities) Unit Trust Fund.
			Market Value 31 March 1959 £10116
			,, ,, ,, *1958 £9245*
			Library Account
471	18	9	British Transport 3% Guaranteed Stock 1978–88 (Bentham Bequest).
191	12	7	4% Australia Stock 1961–64 (Walker & Morey Bequests).
107	2	1	2½% Consolidated Stock (Stebbing Bequest).
1414	7	11	2½% Consolidated Stock (Flintoff Bequest).
530	0	0	3% Savings Bonds 1960–70 (Tagart Bequest).
103	12	5	Surrey County Council 3% 1961–66 (Wakehurst Bequest).
195	0	0	Glasgow Stockholders Trust Ltd. Ord. Stock.
325	0	0	The Globe Telegraph and Trust Co. Ltd. Ord. Stock.
255	0	0	Lonsdale Investment Trust Ltd. Ord. Stock.
575			Peninsular Investment Co. Ltd. 5*s*. shares fully paid.
138	15	0	The Scottish National Trust Co. Ltd. Ord. Stock.
			Market Value 31 March 1959 £5778
			,, ,, ,, *1958 £1711*
			Special Accounts
232	5	0	Metropolitan Water Board 3% B. Stock (Westwood Bequest).
667	14	2	,, ,, ,, ,, ,, (Hooker Lecture Fund).
163	11	5	,, ,, ,, ,, ,, (Goodenough Fund).
557	12	1	2½% Consolidated Stock (Crisp Award Fund).
156	7	2	,, ,, (Westwood Fund).
74	14	6	,, ,, (Hooker Lecture Fund).
149	8	10	,, ,, (Goodenough Fund).
369	11	1	3% Savings Bonds 1955–65 (Staff Pension Fund).
12	4	8	,, ,, ,, (Staff Pension Fund).
100	0	0	,, ,, ,, 1960–70 (Minchin Fund).
102	3	11	3½% War Loan 1952 or after (Trail Award Fund).
			Market Value 31 March 1959 £1661
			,, ,, ,, *1958 £1540*

CRANBROOK, *Treasurer*

We have (in conjunction with the Professional Auditors, who certify as to all details) audited the Accounts of the Society for the year ended 31 March 1959 and found them correct.)
We have verified the investments and Bank Balances.

20 May 1959.

W. B. KEEN & Co., *Chartered Accountants*,
Finsbury Circus House,
Blomfield Street, London, E.C.2.

H. R. HEWER
J. P. M. BRENAN
J. P. HARDING
ETHELWYNN TREWAVAS
MARGARET A. P. MADGE
} *Audit Committee*

BENEFACTIONS

1954–58

LIST *in accordance with Bye-Laws, Chap.* 17, *Sect.* 1, *of all Donations of the amount or value of Twenty pounds and upwards, received during the past five years.*

1954

Mr H. Womersley, A.L.S.: Gift towards cost of paper in *Journal, Zoology*, No. 288, £20.
Imperial Chemical Industries Limited: Gift to Library Fund, £21.
The Royal Society: Grant-in-aid of publications, £100.
Mr A. A. Pearson, F.L.S.: Bequest of Myological Library.

1955

The Royal Society: Grant-in-aid of publications, £1250.
The Percy Sladen Memorial Fund, Cost of printing *Transactions*, Ser. 3, Vol. 1, Part 3, £625 3*s*. 6*d*.
Imperial Chemical Industries Limited: Gift to Library Fund, £21.
The John Innes Horticultural Institution: Gift to Library Fund (£10 1953, 1954 and 1955), £30.

1956

The Royal Society: Grant-in-aid of publications, £1000.
Mr F. J. F. Barrington, F.L.S.: Legacy of £1000.
Sir Sidney F. Harmer, K.B.E., F.R.S., P.P.L.S.: Legacy of £200.
Mr Henry Rissik Marshall, F.L.S.: Gift of books to the Library.

1957

The Royal Society: Grant-in-aid of Publications, £410, and £400 Library Assistance Grant for the purchase of foreign periodicals.
His Majesty The King of Sweden: Gift to assist upkeep of Linnaean MSS., £100.

1958

The Royal Society: Grant-in-aid of publications, £1000.
Dr Hugh Scott, F.R.S., F.L.S.: £500 towards cost of paper in Vol. 170 of the Proceedings.
Dr B. O. Dodge, F.M.L.S.: Gift of $100 for general purposes.
Dr A. Tindell Hopwood, F.L.S.: Gift of books to the Library.
The John Innes Horticultural Institution: (£10 1956, 1957 and 1958) £30.

ADDITIONS AND GIFTS TO THE LIBRARY
1958–59

Note.—Names of donors are given in square brackets. Separate copies of papers which are included in periodicals received by the Library are no longer catalogued.

Acta Botanica Academiae Scientiarum Hungaricae. Vol. 1→ 8vo. *Budapest*, 1954→

Acta Zoologica Academiae Scientiarum Hungaricae. Vol. 1→ 8vo. *Budapest*, 1954→

Ainsworth, G. H. *See* **Chislett, Ralph & Ainsworth, G. H.**

Akbar, S. Shujaatul. On Indian Insect Types. V. The Morphology and Life-history of *Leptocorisa varicornis* Fabr. (Coreidae, Hemiptera). A Pest of Paddy Crop in India. Pt. II. Abdomen, Internal Anatomy and Life-history. 1958.

Armstrong, Edward A. The Folklore of Birds. Pp. xvi + 272. 8vo. *London*, 1958.

Babeș, A. *See* **Parhon, C. I., Babeș, A. & Petrea, I.**

Bartram, Williams. *See* **Harper, Francis**—*edited by.*

Bässler, Ulrich. Versuche zur Orientierung der Stechmücken: Die Schwarmbildung und die Bedeutung des Johnstonschen Organs. (Repr. Z. vergl. Physiol., vol. 41, 1958.)

Bauer, Karl. Sinnesökologische Untersuchungen an *Lithobius forficatus*. 1955.

Becker, G. & others. Tournefort. Pp. 321. 8vo. *Paris*, 1957. [Prof. R. Heim.]

Berg, Kaj. Professor C. Wesenberg-Lund. (Repr. Verh. internat. Ver. Limnol., vol. 13, 1958.)

— — Investigations on Fure Lake 1950–54. (Fol. Limnol. Scand., No. 10, 1958.)

— — Ecological Remarks on the Bottom Fauna of a Danish Humic Acid Lake, Store Gribsø. (Repr. Rev. int. Ass. Limnol., vol. 12, 1955.) [Author.]

Bhandari, M. M. *See* **Sarup, Shanti & Bhandari, M. M.**

Bogdan, A. V. The Selection of Tropical Ley Grasses in Kenya: General Considerations and Methods. (Repr. E. African Agric. J., vol. 24, 1959.) [Author.]

— — A Revised List of Kenya Grasses. 1958. [Author.]

— — *See* **Dougall, H. W. & Bogdan, A. V.**

Bogoriensis. An Alphabetical List of Plant Species Cultivated in the Hortus Botanicus Bogoriensis. [Council for Sciences of Indonesia.]

Boletin del Museo de Ciencias Naturales, Caracas. Vol. 1→ 8vo. *Caracas*, 1955→ [Mus. Cienc. Nat., Caracas.]

Bose Institute. Centenary Celebrations 1958. Messages and Greetings. [Bose Institute.]

Bristowe, W. S. The World of Spiders. Pp. xiii + 304. 8vo. *London*, 1958.

British Museum (Natural History). The Sloane Herbarium. Revised and Edited by J. E. Dandy. Pp. 246. 4to. *London*, 1958. [British Museum (Natural History).]

British Museum (Natural History). Swinton, W. E.—Fossil Amphibians and Reptiles. Ed. 2. Pp. ix + 118. 8vo. *London*, 1958. [British Museum (Natural History).]

British Museum (Natural History). List of Serial Publications in the Library of the Department of Zoology. Pp. 154. 8vo. *London*, 1958. [British Museum (Natural History)]

Brown, Margaret E.—*edited by.* The Physiology of Fishes. Vol. 1—Metabolism, Vol. 2—Behavior. Pp. xiii + 447, xi + 526. 8vo. *New York*, 1957.

Brown, S. C. S. Philip Harwood—Obituary. (Repr. Ent. mon. Mag., vol. 94, 1958.) [Hope Dept Entom., Oxford.]

Bulletin of the Central Research Institute, University of Travancore, Kerala, Trivandrum. Vol. 2→ 8vo. *Trivandrum*, 1951→

Bulletin of Leningrad University (Translation). Series: Biology. No. 1→ 8vo. Leningrad, 1956→

Bulletin of Moscow University (Translation). Series: Biology, Geology and Geography. No. 1.→ 8vo. *Moscow*, 1957→

Burges, Alan. Micro-Organisms in the Soil. Pp. 188. 8vo. *London*, 1958. [Publishers.]

Bütow, Rosemarie. Die Entwicklung der Pulsatilla-Anthere. (Repr. Z. Bot., vol. 43, 1954.)

Carthy, J. D. An Introduction to the Behaviour of Invertebrates. Pp. xi + 380. 8vo. *London*, 1958.

Cayouette, Richard. Charles de Linné (1707–78). (Repr. Carnets Soc. Zool. Québec, vol. 19, 1959.) [Soc. Linn. Quebec.]

Celarier, Robert P. & Harlan, Jack R. Old World Bluestems. (From Ann. Rep. Forage Crops Res., Oklahoma, 1957.) [Prof. R. P. Celarier.]

Chamot, Émile Monnin & Mason, Clyde Walter. Handbook of Chemical Microscopy. 3rd ed. Vol. 1. Pp. xii + 502. 8vo. *London*, 1958. [Publishers.]

Chastain, André. La Flore et la Végétation des Iles de Kerguelen. (From Mem. Mus. Nat. Hist. Nat. Paris, vol. 11, 1958.) Pp. 136 + 36 pl. [Author.]

Chislett, Ralph & Ainsworth, G. H. Birds on the Spurn Peninsula. Part I—General; and Turdidae to Prunella. Pp. 99. 8vo. *London*, 1958.

Claridge, M. F. The Biritish and Scandinavian Species of the Genus *Cheiloneurus* Westwood (Hym., Encyrtinae). (Repr. Ent. mon. Mag., vol. 95, 1958.) [Hope Dept Entom., Oxford.]

— — A Contribution to the Biology and Taxonomy of the British Species of the Genus *Eudecatoma* Ashmead (=*Decatoma* Auctt. nec Spinola) (Hym., Eurytomidae). (From Trans. Soc. Brit. Ent., vol. 13, 1959.) [Hope Dept Entom., Oxford.]

— — *Tetramesa* Walker, 1848, a Valid Name for *Isosoma* Walker, 1832, in place of *Harmolita* Motschulsky, 1863, with a Short Discussion on Some Eurytomid Genera (Hym., Eurytomidae). (Repr. Ent. mon. Mag., vol. 94, 1958.) [Hope Dept Entom., Oxford.]

Colhoun, John. *See* **Muskett, Arthur E. & Colhoun, John.**

Collins, Vera G. & Kipling, Charlotte. The Enumeration of Waterborne Bacteria by a New Direct Count Method. (Repr. J. appl. Bact., vol. 20, 1957.)

Croizat, Léon. Panbiogeography. Vols. I, II*a* and II*b*. Pp. xxxi + 1018 + 1730. 8vo. *Caracas*, 1958. [Author.]

Crook, Frederick. Integration of Science. 1958. [Author.]

Crowder, Loy V. Iniciacion de la Investigacion de Pastos y Forrajes en Colombia. (Repr. Agricultura Tropical, vol. 14, 1958.) [Min. Agric., Colombia.]

Dandy, J. E.—*edited by*. *See* **British Museum (Natural History).**

Darlington, C. D. Evolution of Genetic Systems. Pp. x + 265. 8vo. *London*, 1958.

Darlington, Philip J. Zoogeography: The Geographical Distribution of Animals. Pp. xi + 675. 8vo. *New York*, 1957. [Dr. B. M. Hobby.]

Darwin, Charles. Series of Pictures, Devoted to the 150th Anniversary of the Birth (from 'Museum Darwinianum' of Moscow). 8vo. *Moscow*, 1958. [Prof. Dr A. E. Kohts.]

— — Recollections of the Development of my Mind and Character (Autobiography) 1876–81. Journal (Personal diary), 1838–81. *Translated* in Russian by S. L. Sobol. Pp. 251. 8vo. *Moscow*, 1957. [Prof. Dr E. N. Pavlovsky.]

Das, R. B. & Sarup, Shanti. The Biological Spectrum of the Indian Desert Flora. (Repr. Univ. Rajputana Stud., Biol., 1951.) [Prof. S. Sarup.]

de V. Graham, M. W. R. Keys to the British Genera and Species of Elachertinae, Eulophinae, Entedontinae, and Eudernae (Hym., Chalcidoidea). (From Trans. Soc. Brit. Ent., vol. 13, 1959.) [Hope Dept Entom., Oxford.]

— — Notes on Pteromalidae (Hym., Chalcidoidea), with Descriptions of New Genera and Species. (From Trans. Soc. Brit. Ent., vol. 13, 1959.) [Hope Dept Entom., Oxford.]

— — The Identity of the Genus *Janvartsovia* Nikol'skaya (Hym., Chalcidoidea, Pteromalidae). (Repr. Ent. mon. Mag., vol. 94, 1958.) [Hope Dept Entom., Oxford.]

— — *Merisus splendidus* Walker (Hym., Chalcidoidea, Pteromalidae). (Repr. Ent. mon. Mag., vol. 94, 1958.) [Hope Dept Entom., Oxford.]

Deraniyagala, P. E. P. The Pleistocene of Ceylon. Pp. viii + 164 + 58 plates. 4to. *Ceylon*, 1958. [Author.]

De Sousa da Camara, Emmanuele. Catalogus Systematicus Fungorum Omnium Lusitaniae. Vol. 1. Basidiomycetes. Pt. 1. Hymeniales. Pp. 347. 8vo. *Lisboa*, 1956. [Ministry of Economics—Portugal.]

de Wit, H. C. D. *Aponogeton stachroporus*, sp. nov. (Repr. Meded. Bot. Tuinen Belmonte Arboretum Landbouwhogeschcol Waningen, vol. 2, 1958.) [Author.]

— — *Cryptocoryne affinis*. (Repr. Fishkeeping, 1958.) [Author.]

— — *Cryptocoryne griffithii and its Allies*. (Repr. Fishkeeping, 1958.) [Author.]

— — A Large and Versatile Cryptocoryne. (Repr. Fishkeeping, 1958.) [Author.]

— — Mainly on Cryptocoryne. [Author.]

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